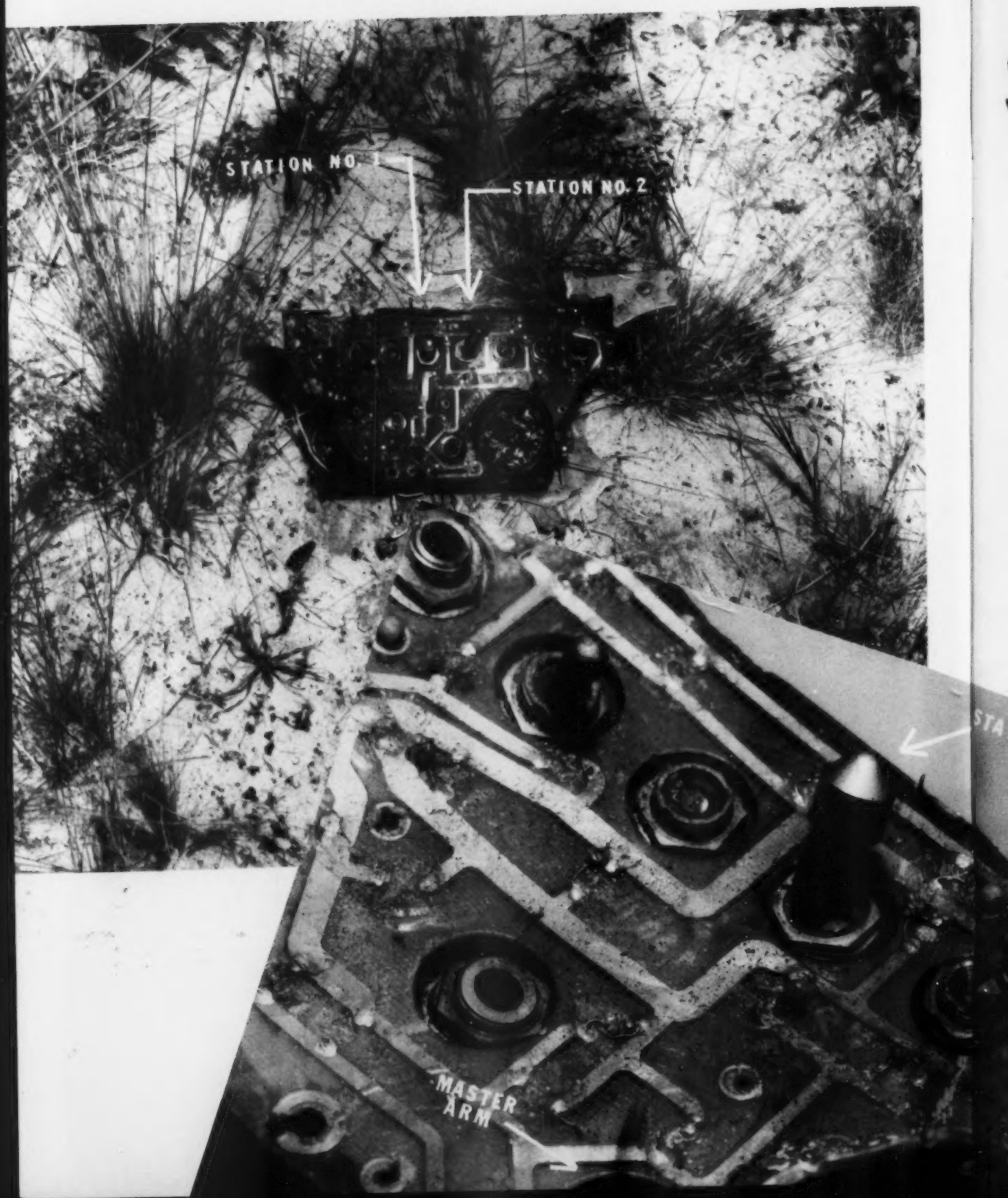
A Naval Safety Center Publication

approach

APRIL 1972 THE NAVAL A

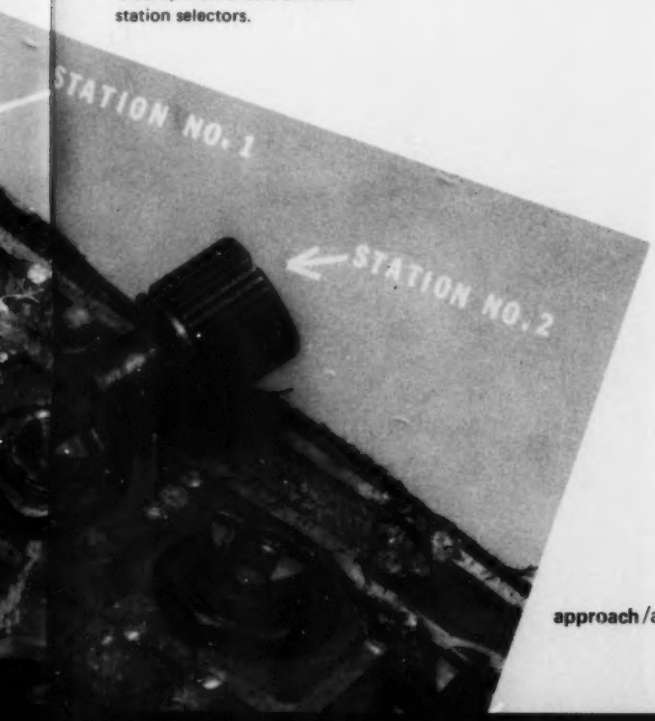

STATION NO. 1
STATION NO. 2
MASTER ARM

STACK THE ODDS against an accident!

An accident can often be prevented by the action or actions of one or more individuals. Those mishaps caused by a single individual usually involve gross error in judgment. However, most accidents are the end result of a set of circumstances or sequence of events which may involve failure of both personnel and equipment. Speaking before the fact of an accident, if these failures can be eliminated, the odds are then favorably stacked against having an accident.

To illustrate the point, a discussion follows wherein several seemingly insignificant errors, when combined, added up to an accident.

Closeup view shows different station selectors.



THE ACCIDENT involved a *Skyhawk*, an A-4E. Following a low-level navigation flight and a 500-knot over-the-shoulder maneuver in the target area, the pilot set up for a 10-degree conventional bombing pattern with a briefed 1000-foot release. On his first dive attempt, the pilot crashed at the 0530 position about 250 meters short of the target. The aircraft disintegrated and the pilot was fatally injured.

Target spotters reported sighting a white object falling from the aircraft while it was in its run. This was determined to have been the aft section of a 300-gallon droptank which fell about ¼-mile short of the impact point. Investigation revealed the most probable sequence of events in the accident to have been as follows:

For this flight, practice ordnance (Mk-76s) were hung on wing stations one and five and 300-gallon droptanks on stations two and four. The pilot intended to select Mk-76 bombs on station one but unintentionally selected station two, which contained a droptank.

At release altitude the pilot pressed the pickle. Ordinarily, no problem would have occurred in such a situation except for the inadvertent release of a droptank. However, in this case, the droptank did not release normally. That is, the rear hooks of the

Aero-20A ejector rack released, but the front hooks did not. As the rear hooks released, the after end of the droptank swung downward, but air loads forced it upwards into the wing. The fuel standpipe on top of the tank struck the underside of the wing (or ejector rack). The force of the blow caused a failure in the weld at the base of the standpipe. This crack immediately widened into a crack all around the circumference of the tank, causing the after end of the tank to separate (the object witnesses saw falling).

As the aft section of the tank separated, the forward section of the tank (still attached to the front hooks of the ejector rack) swiveled inboard, creating heavy drag. This caused the aircraft to roll uncontrollably for about 4 seconds prior to impact, making it impossible for the pilot to initiate ejection.

The sequence of events, as hypothesized above, immediately raises several questions, i.e.:

(1) Why did the pilot select station two for drop when he intended to select station one?

(2) When the pickle was pressed, why did the front hooks of the ejector rack fail to release?

(3) Why did the weld at the base of the tank fail (causing the loss of the rear section of the tank) when air loads caused the tank to strike the underside of the wing (or ejector rack)?

Why Was the Wrong Station Selected?

The most probable reason was the existing switch configuration on the ordnance panel. That is, the switches for station two through five were a new type which featured a rotary locking knob on the end of each switch (see photos at beginning of article). Station one, however, had a standard lift-to-unlock toggle switch. This unusual configuration came about in this manner: AFC (Airframe Change) 438 of 27 Oct 1969 directed that all station select switches be changed to the type which feature the rotary locking knob. This was done; however, at some later date, it became necessary to replace the switch for station one. The IPB (Illustrated Parts Breakdown) was consulted for switch nomenclature and part number. The IPB still referenced the old standard lift-to-unlock switch, and this was the switch ordered and installed in the panel. A check of the IPB after the accident showed that the information pertaining to the switch had not been updated since the issue of AFC 438.

It seems likely that the pilot relied primarily on the feel of the switches, rather than sight, and merely selected the switch which was furthest left on the panel and was of the type he expected, i.e., the rotary locking type. Thus, he inadvertently selected the wrong station.

Continued

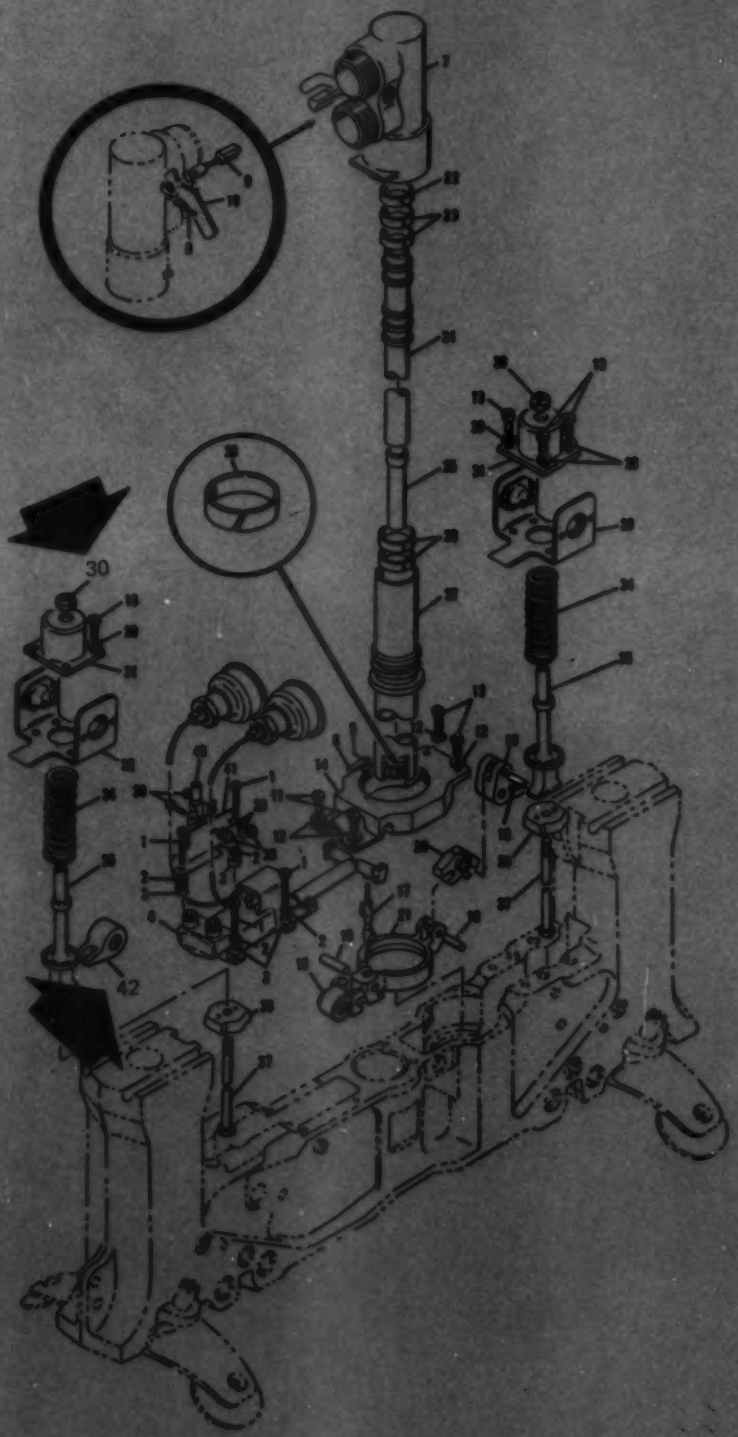


Fig. 1

Two Hook Ejector Rack (Aero 20A-1) (A-4E)

Why Did the Front Hook Fail to Release?

The most probable reason is that the nut, Fig. 1 (item 30), was either missing – or ineffective in performing its designed function because of stripped threads. During the postaccident disassembly of the Aero-20A rack, it was noted that this nut was missing. This nut holds the forward hook sear on its spacer assembly. When the ejector cartridges fire, it causes the fork assembly, Fig. 1 (item 42), to rotate, lifting the sear from between the forward attaching hooks, allowing the attaching hooks to open and release the tank lug. Postaccident investigation revealed that with the nut missing, the sear will not be withdrawn from the attaching hooks. This can be more clearly visualized by referring to Fig. 2.

Inspection of the sear bolt showed that 2½ threads of the bolt still contained the complete threading of the nut. This leads to the supposition that the nut may have been overtorqued and threads stripped at some time prior to the flight. In this connection, the nut is of a self-locking type with three metal threads and three synthetic threads. The substance forms around the bolt and makes it very difficult to back the nut off.

Several possibilities exist as to why the nut was missing. It could be that the nut was missing prior to flight; or it could have been of the wrong size; or perhaps it had been overtorqued, causing the threads to strip and allowing the nut to come off when the ejector cartridge fired. The latter is considered most likely.

The conclusion is that the nut was sufficient for its specified purpose, i.e., to hold the sear assembly together, and was self-locking. However, it is nonetheless unable to withstand even light overtorquing. Accordingly, manufacturer's representatives and NAVSAFECEN personnel are pursuing the question of which of several sear retaining nuts, available in supply, should be used on the Aero-20A.

Why Did the Standpipe Weld Fail?

A material laboratory investigation showed that the weld failed from overstress caused by the force of the blow to which it was subjected.

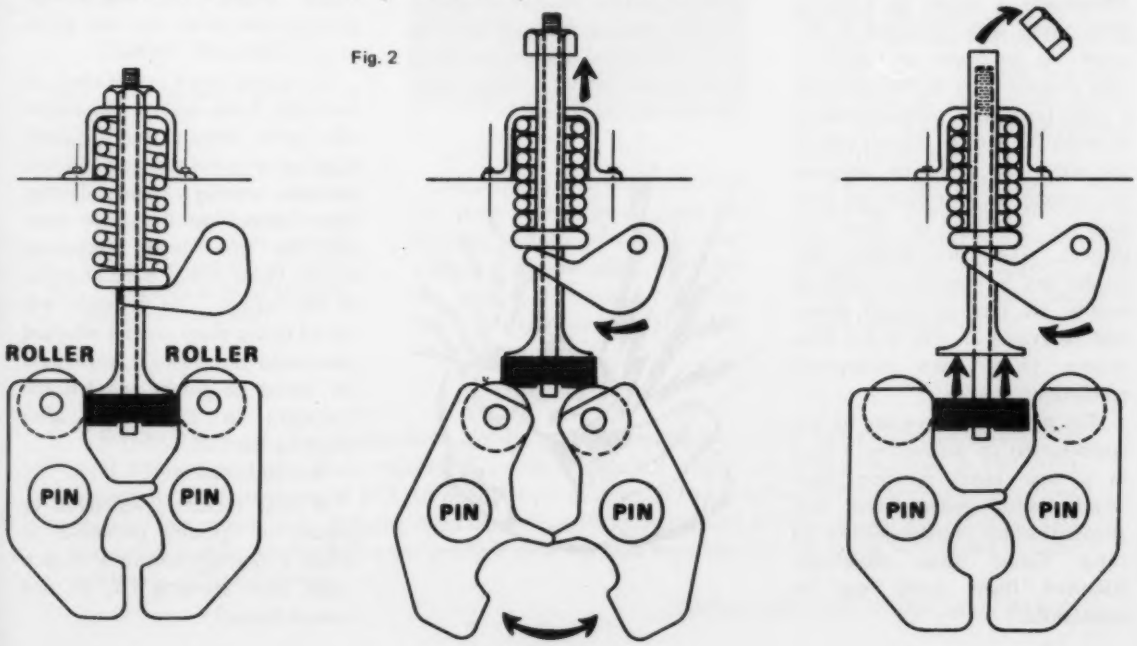
Preventing Accidents

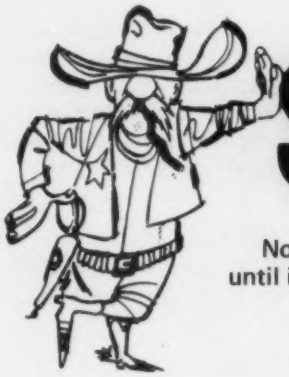
If any one factor could have been eliminated in this chain of circumstance, it is likely that the accident would not have occurred.

When it comes to preventing accidents such as this, ***all hands – each of us*** – must realize that we really are our brother's keeper. Moreover, we must realize that, whatever our job, every action performed which is even remotely connected with flight, has a potential to increase or decrease safety. If the potential becomes great enough, it may take only a relatively minor error to complete the chain of circumstance and result in a tragic accident.

Safety is an all hands job. Whatever you do – give it your very best. Never forget – the performance of even the most seemingly insignificant function in naval aviation can, and often does, have an important bearing on safety.

Fig. 2





Short Snorts

Not everything that is faced can be changed. But nothing can be changed until it is faced.

James Baldwin

'Round & 'Round We Go

USS Flatop: Angel are you in any difficulty?

Angel: Affirmative. Request immediate landing.

USS Flatop: Cleared to land forward of the wires.

THE ABOVE short conversation took place between the air boss of a CVA and the pilot of a plane guard helicopter one morning during flight operations.

The helicopter pilot had been maintaining a hover in a strong gusty wind with all gages in the green. As he began to transition into forward flight he also initiated a right turn. At a point estimated between 30 and 45 degrees out of the wind, the helicopter whipped into a rapid, uncontrolled right turn with a pitchup of about 15 degrees. The pilot applied left rudder and forward cyclic with no results. He then decreased power and recovered at 100 feet – after more than two complete revolutions.

The incident was caused by the combination of attempting a turn in a near hover position (high winds, high power, and low airspeed) which overstressed the tail rotor. Under these conditions, balanced flight could not be maintained.

For Want of a Spark

ONE bright, sunny, summer morning a CH-53D departed on a local IFR training flight.

One bright, sunny, summer morning the CH-53 pilot was advised by his crew chief that the cabin deck was covered with fuel.

That same bright, sunny, summer morning the CH-53D pilot made an immediate emergency landing with all non-essential electrical equipment off.

The day remained bright and sunny outside, but the air became blue, as sparks flew inside a certain office when an investigation disclosed the internal fuel tank was not hooked up. The unconnected fuel line had allowed fuel to drain out onto the cabin deck.

The CO said, " . . . this incident should not have occurred. An improper preflight by the crew chief and pilot resulted in this unneccessary incident. The proper preflighting of aircraft by all crew chiefs and pilots has been stressed in the past and will continue to be stressed by this command."

FOD

DURING engine start of a TA-4J, prior to a routine instrument training flight, a metallic thump was heard, accompanied by three irregular engine surges. The engine was quickly shut down, and the pilots exited the aircraft.

Investigation revealed a flashlight lying against the engine inlet guide vanes at the 6 o'clock position with the rear cap and two batteries missing. Visible damage was observed on the guide vanes and the first three compressor stages. Metal filings were observed in the tailpipe. The flashlight was traced to the plane captain who had performed the preflight inspection. He stated he *forgot* and left the flashlight in the intake after checking the CSD.

Recommendations:

- That increased emphasis be placed on ground personnel to effect a thorough inventory of their tools after working on, in, and around aircraft.

• That the actual inspection of the A-4 RH engine inlet for foreign objects be performed by the plane captain in the pilot's presence during preflight. The present procedures of the pilot inspecting the RH duct after climbing into the cockpit, either by leaning over the cockpit from the boarding ladder or leaning out of the cockpit, appears inadequate. The pilot cannot get a full view of the RH intake. And too, this procedure is considered unsafe for the pilot.

This incident was the result of a distraction to the normal procedures encountered by the plane captain as he preflighted the CSD. A dropped tool . . . plane captain out of intake to retrieve it . . . flashlight left in intake. A regrettable, but predictable chain of events which resulted in FOD to an engine. All hands in this command have again been instructed on the requirement of accounting for all tools after completing a task, and of the importance of not rushing to complete any job.

Recent Attack Squadron Message

Cleared To Land

GCA: Tower, I have a "Hummer" on final to land.

Tower: He's cleared.

GCA: "Hummer" 705, you're over touchdown. The tower clears you to land, turn right, speed permitting, at first available taxiway. Contact ground control.

705: Roger GCA. Good approach. Leaving your frequency.

FLIP Changes

THE Department of Air Force, Headquarters Aeronautical Chart and Information Center, St. Louis, Missouri has notified the Naval Safety Center of the following changes to FLIP documents:

High Density Traffic Airports: FAA is extending for 1 year the special air traffic rule for high density traffic airports which was scheduled to expire on 25 October 1971. *(See Section II, Planning for Operations Reservations for High Density Traffic Airports.)* Reservation requirements for operation into and out of Kennedy International Airport and O'Hare International Airport have been modified and are now required between the hours of 1500 and 2000 (local time). La Guardia Airport and Washington National Airport require reservations between the hours of 0600 and 2400 (local time).

WHILE the E-2 was on rollout the tower called him on guard and directed him to turn right, *now*! The pilot acknowledged, but when he saw there wasn't anything remotely resembling a taxiway, he asked for clarification. The pilot of the "Hummer" looked back up the runway, gasped as he saw an A-3 boresighting him, and eased the E-2 to the very edge of the runway just as the *Skywarrior* zipped by on rollout.

Investigation disclosed that the A-3 had been making a TACAN approach, 1½-miles separation, and was cleared to land behind the E-2 on the same runway!

Now something like that really "shakes the dew off the lily doesn't it?" It isn't legal, but there are few pilots who wouldn't have sided with the entire E-2 crew if they had challenged both the tower controller and the A-3 driver to a duel at five paces for such actions. It really rankles to think a guy has to put up with stuff like this.

The controller stated that on landing rollout the E-2 *appeared* to be slowing down sufficiently to make the turnoff that the *controller* desired. He called on guard with his request but the "Hummer" had passed the intersection. Then the controller committed the sin of sins – he did nothing. He didn't order the A-3 to waveoff, he didn't advise the E-2 of landing traffic, and the A-3 pilot, with head up and locked, landed with the "Hummer" about halfway down the runway.

There are, at least, 1001 dedicated, heads-up controllers in Navy towers who would never have permitted this to happen. How come the four remaining happened to get hold of a "mike?"

Safety Tip

EXERCISE proper fuel management. Two recent helo mishaps caused by fuel exhaustion were due to poor fuel management. These mishaps occurred despite the inflight flexibility available in helicopter operations. Fuel management in fixed-wing aircraft includes different factors but similarly requires proper planning and attention to changing flight conditions. Pilots must know aircraft performance limits and fuel consumption data; *accomplish proper preflight planning*; and be prepared to accommodate changes in flight conditions. *(Editor's italics.)*

COMNAVAIRLANT Weekly Safety Bulletin

Cut

t the Cable!

SAR helicopter pilots assigned to shore stations often find themselves involved in a variety of flights. Sometimes the frequency of operational flights relegates training flights to a low priority. However, occasionally an opportunity arises to combine the two, i.e., to perform some training during or after an operational commitment.

Such was the case one fine day when the crew of a UH-2C was scheduled to conduct an ADDS (Air Drop Delivery System) exercise with a US-2B. The helicopter crew was to assist in the recovery of the ADDS package. Upon completion of the exercise the helicopter crew planned to conduct overwater training to achieve additional crew qualifications.

During the briefing, particular attention was directed toward hoist operations, ditching procedures, and high hovers – out of salt spray. It was agreed between the pilots that the cable-cut power switch would be armed only if the HAC requested it. In addition to the two pilots and crew chief, there were three aircrew trainees and an aircrew training petty officer aboard the aircraft. Qualification requirements consisted of two hoist pickups for each man – one of which was to be a simulated immobile rescue.

All members of the crew were inspected to ensure that appropriate survival equipment was worn and in good working order. The HAC carefully explained the flight patterns to be flown and advised the crew they would perform the training evolutions after the ADDS package had been retrieved.

The HAC, recognizing the inexperience of his copilot with the aircraft (10 hours in model), conducted a thorough briefing and preflight. One minor discrepancy was discovered on preflight; there was intermittent operation of the hoist control switch. This was quickly rectified.

Further delay ensued when the US-2B went "down" on turnup and the crew had to switch aircraft. During the wait, the helicopter took on an additional 400 pounds of fuel. Finally, everything was ready and both aircraft launched.

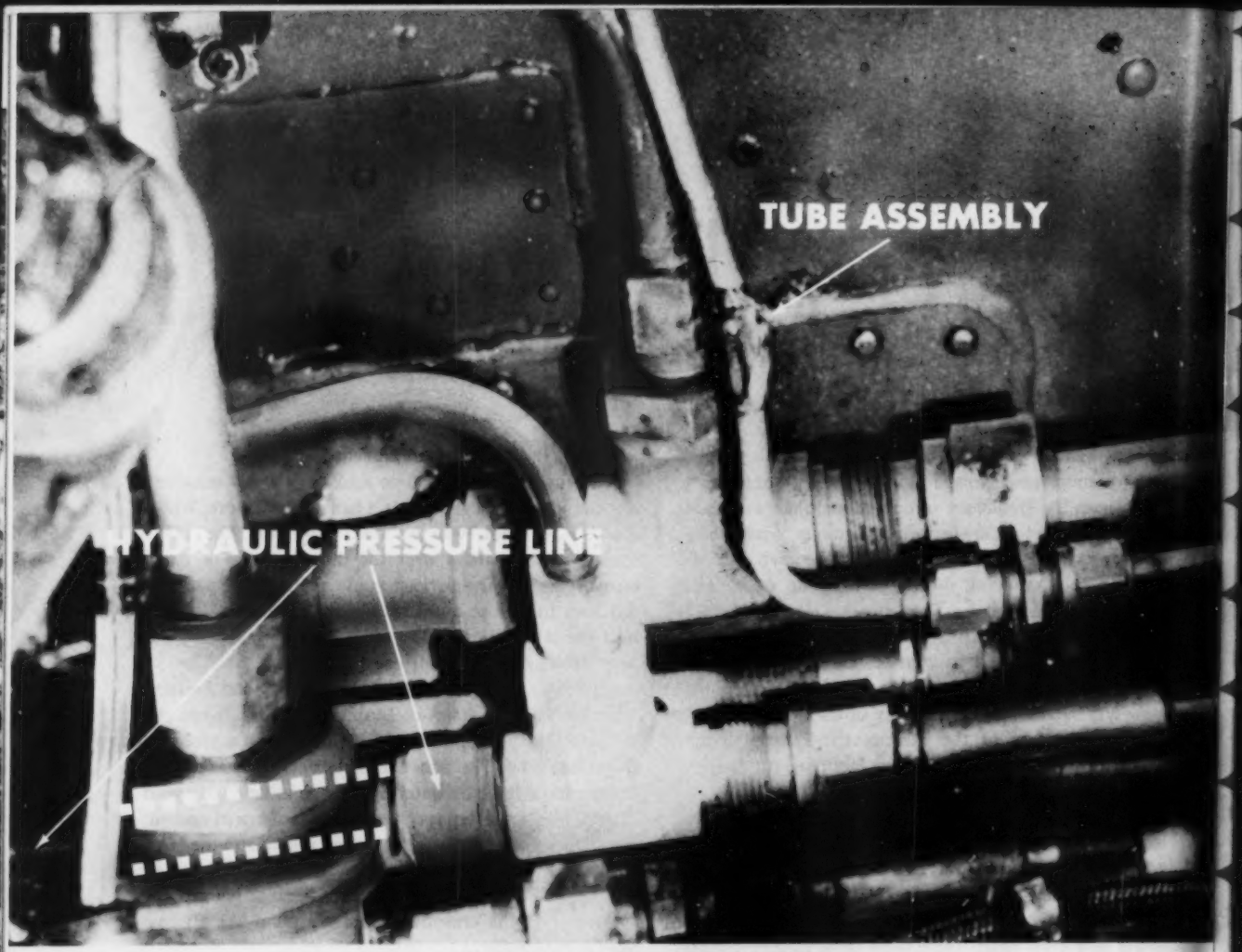
The flight to the coastline took only a few minutes, and the exercise began about a half mile offshore. While the US-2B pilot was on his drop run, the HAC maneuvered to arrive over the drop area for a rapid recovery should the package begin sinking. The package did start to sink so a qualified aircrewman was lowered into the water. He quickly attached the package to the hoist cable, and it was retrieved.

The next half hour was spent lowering and hoisting the three aircrew trainees. During one of the hoists the HAC felt the helicopter shudder. Recognizing a probable boost disconnect, he directed the crew chief to lower the trainee back into the water. Almost simultaneously with his order, a rapid series of violent control inputs ensued. The helicopter yawed, pitched, and rolled, and the HAC later reported, "I had no control." He repeatedly asked the copilot to arm the cable cutter because his primary concern was the crewman bobbing around like a yo-yo on the hoist cable.

The copilot failed to hear the HAC since the crew chief was on the ICS giving continuous hoisting directions. The pilot could not override the crew chief. The hydraulic pressure warning light illuminated, and the pressure gage was fluctuating between zero and 1000 pounds.

The HAC realized that transition to forward flight was necessary despite the man on the hoist. As he began transition, he regained control of the helicopter just as the copilot disconnected the hydraulic actuator *at the crew chief's suggestion.*

Now flying at 40 knots and 60 feet, away from the beach, the HAC reversed direction and instructed the crew to prepare to ditch since it might become necessary. Because of the large number of sightseers in the area where they had been operating, the pilot had to fly parallel to the shoreline to an area where he could safely drop the crewman. Slowing to 30 knots he severed the cable, dropping the crewman into the water. The pilot then made an orbit and used the loud-hailer to



Portion of H-2 main hydraulic system installation

ascertain the crewman's condition.

When the HAC got a thumbs up from the crewman, he departed for Homeplate. He contacted the tower and advised them of the position of the man in the water and then made an uneventful, no-boost, run-on landing.

Meanwhile, wheels were put in motion to recover the crewman. He was picked up by the Shore Patrol, transferred to an ambulance, and taken to a Naval Hospital. He received a severe back strain due to his free fall into the water; after 4 day's observation he was released for duty.

After landing, strong electrical fumes were noted and, the HAC secured the generator and battery. The fumes were caused by a burned out hydraulic pump. The wild gyrations had been caused by the failure of the hydraulic pressure line which was worn through by chafing against the union. (Bottom left corner of photo.) It was also noted that the tube assembly (center of photo) was distorted (most likely by being used as a step). It could not be determined exactly when the tube assembly had been damaged.

The CO commented, "It was determined that the copilot's action, taken without direction from the pilot, in disconnecting the hydraulic boost was an effort to assist the pilot in maintaining control of the helicopter. However, the pilot in command of an aircraft has the ultimate responsibility for the conduct and safety of each flight, and all crewmembers should be certain they are acting within the orders of the pilot. Lack of experience is all the more reason that a crewmember should not take any action without the consent of the pilot in command." While the copilot's action was essentially correct in this instance, his independent action could have resulted in compounding the controllability of the helicopter, if the pilot's analysis of possible rotor imbalance had been correct.

Proper discipline must, of course, exist among members of a flight crew. ◄

H-46 Ground Accident

It Takes Two Hands to Handle a Chopper

THE MORNING AOM ended on the half hour and many officers left the readyroom for their LSDs (Large Steel Desks), while others eased up to the coffee urn to draw one for the road. The XO asked the ops officer to stop by his office to talk about revising a couple of instructions that needed rewriting. While they were discussing the matter, the maintenance officer entered the room, a folder in each hand, and stood until the XO pointed to a chair.

While the XO and Ops continued their discussion, the maintenance officer sat down, opened a folder, and began to read. He was distracted when the XO asked him a question concerning engine starts by duly designated, qualified enlisted personnel. As usual, there was good natured banter between the ops officer and maintenance officer during the latter's answer. It was good natured in that, despite long and often heated arguments, the two were good friends – they just didn't see the same thing in the same way. Par for the course.

The particular subject involved turnups, and since they were members of a helicopter squadron, the discussion involved turnups only – *not rotor engagements*. Little did any of them realize, at the time of the discussion, that events would soon make anything they agreed on merely academic.

Earlier, before the maintenance officer left his office to see the XO, he passed the word to get a turnup pilot for "50." The H-46 needed a ground turnup to check the aft transmission. It would be necessary to engage and run for about 15 minutes so a transmission oil sample could be taken.

When all was ready, a first tour pilot showed up to perform the turn. After conducting a preflight, the pilot strapped into the right seat, and completed the checklist. Engine start was normal. He positioned the cyclic slightly forward of neutral, rudders neutral, and *held the collective down with his leg*. The rotors were engaged, and the aircraft shook normally until the condition levers were advanced to fly – whereupon noticeable lateral vibrations were felt.

The pilot rechecked the controls to ensure they were neutral. The vibrations continued to increase in intensity. The pilot suspected ground resonance and pulled up-collective. The aircraft entered an unstable hover but the vibrations ceased. The SAS (system automatic stabilization) was not engaged and the pilot made no attempt to engage it. Instead, he landed in a nose-high attitude and when no vibrations were felt, lowered the nose and secured the aircraft. The cargo hatch, open but with the gustlock engaged, contacted the ramp and damaged the aft pylon area adjacent to the cargo hatch.

The pilot had no one in the left seat to read the checklist and monitor the controls during rotor engagement. In order to advance the engine condition levers to fly, it was necessary for him to remove his left hand from the collective and, while advancing the engine condition levers, *apply pressure with his leg to ensure the collective didn't move.*

It is theorized that when the pilot leaned forward to advance the throttles, he exerted pressure with his leg on the collective. When normal engagement vibrations ensued, his leg, acting as a rigid link, induced further vibrations which he mistook for ground resonance.

One week before the mishap, the pilot had presented a lecture during an AOM on ground resonance which may have been a contributing factor in his thinking. At any rate, he reacted as any helo pilot suspecting ground resonance would. He launched. (For the benefit of any reader, not familiar with helos, the only way to stop true ground resonance is to get off the ground.) However, his problem then became compounded, since the SAS was not engaged, and he physically couldn't let go of the collective to turn it on by himself. His landing in the unstable condition, with the cargo hatch open, resulted in damage to the helicopter.

Any H-46 pilot with little or no experience in SAS-off flight has his hands full. This situation isn't even a piece of cake for old hands.

Just for the record, the squadron report emphasized that ground turnups should not normally be performed with only one person in the cockpit. The squadron also pointed out the importance of the person not involved in engaging the rotors (copilot), monitoring the controls to preclude pilot induced vibrations, and to ensure the collective stays in the 3-degree detent. The squadron also recommended SAS-off flight training, under controlled conditions.

Later that afternoon the XO, Ops and maintenance officers, who earlier were discussing certain changes to squadron instructions, met again to consider changes to the changes.

Things To Come

Aircraft Lox Generators

By Mr. Bill Valenteen
NADC

LOX (liquid oxygen) supply systems are primarily used in the fleet to provide breathing oxygen to the crew of an aircraft. Aboard a carrier, lox is provided by two generators that operate alternately for a period of 24 hours (these generators also provide liquid nitrogen for purging IR cooling and other applications). The generated oxygen is then transferred from a storage tank to portable storage tanks on service carts which are used to fill lox converters aboard each aircraft. During this cycle, the dangers of fire and contamination, as well as the attendant problems of breakdown and failure, are a continually haunting specter. The combat effectiveness of a squadron or an entire air wing could be hampered as a result of such logistics and ground/carrier support problems, or damage to the carrier-stored oxygen supply.

Operational limitations imposed as a result of the current method of handling and stowing lox breathing supply systems often restrict the availability of aircraft for extended missions.

The need to develop a self-contained, airborne life support system that will generate oxygen for breathing purposes has been apparent for some time.

In pursuit of this goal, engineering personnel of the Crew Systems Department of NADC (Naval Air Development Center) Warminster, Pennsylvania appear to be on the edge of a breakthrough. As a direct offshoot of a continuing program of research and development related to the use of lox, experimental systems are being evaluated that would eliminate the need for current stored systems and equipment. In cooperation with the Air Force and NASA, NADC is in the process of developing an *onboard, self-contained airborne system* that would generate oxygen in sufficient quantity for use by aircrewmen.

Development of an oxygen generator capable of producing sufficient oxygen to operate an *open system* (discharging of exhaled gases without reuse) is well within current technological capabilities. However, the operation of such a system requires more electrical power than is currently available in operational aircraft (900 watts). Nevertheless, new developments may allow for low-power, open oxygen systems in the near future.

In the meantime, high-performance aircraft now being developed will be capable of supplying sufficient power to operate an oxygen generation system with sufficient output to make the recovery of exhaled gases unnecessary. An *open system* is more desirable since problems associated with recovering exhaled oxygen and nitrogen purging are eliminated. The system is, therefore, much less complex.

Oxygen generator concepts currently being studied for subsequent hardware development include:

- An oxygen concentrator which is based on the electrochemical concentration of oxygen from engine bleed air. In operation, water is decomposed into oxygen and hydrogen ions; the oxygen is released in the gaseous state for accumulation and use, and the hydrogen ions combine with the oxygen in the engine bleed air to form water to repeat the process.

- A chemical-mechanical system based on reversible barium-oxide-dioxide chemical reaction to concentrate oxygen from engine bleed air. The process uses a constant temperature in which a heated bed of barium oxide crystals absorbs oxygen from an air supply under pressure, then reverses to give off oxygen when a vacuum is applied.

- A temperature-cycled chemical system using a metal chelate compound for reversibly sorbing oxygen from engine bleed air. In this system, a chelate (fluomine) bed absorbs oxygen when exposed to air, and when the air supply is cut off the fluomine bed is heated, causing it to release oxygen for use and consumption. The latter two systems use dual sorbent beds to allow one bed to supply oxygen to the aircrewman, while the second bed is absorbing oxygen.

- An electrolysis system which separates oxygen from a water supply.

Ed Boscola, an engineer in the Crew Systems Department at the NADC, poses with three of the self-contained open system airborne oxygen generation systems currently being considered for use aboard future naval aircraft. In operation, the systems are designed to operate without dependence on ground support equipment.

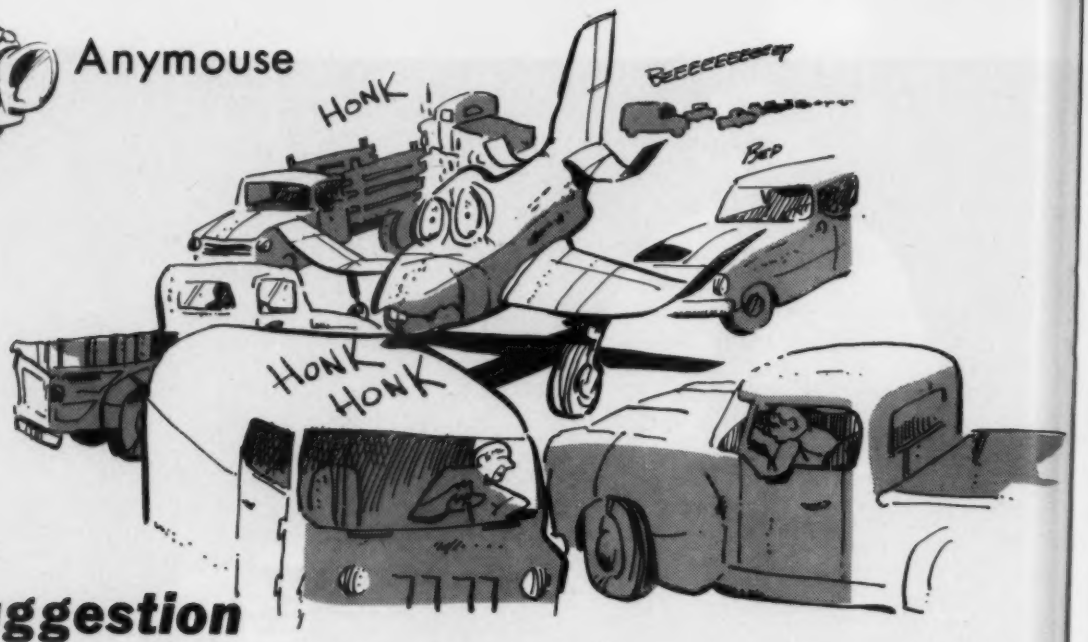
These concepts represent a continuous source of oxygen whenever the aircraft is in operation. They require only electrical power and/or water. Any one of the systems will provide sufficient oxygen to meet the breathing requirements of the aircrewmen, accommodate system leakage, and fill an accumulator which acts as a storage container. In addition, each of the systems provides 30 minutes of emergency oxygen independent of the aircraft utilities.

The use of any one of these systems will eliminate the need for the bulky ground support equipment and the space it now occupies aboard a carrier (60,000 pounds and 2300 square feet respectively). More importantly, however, aircraft turnaround time with respect to oxygen will be reduced to nearly zero. In addition, flight duration will be increased to over 1000 operational hours without maintenance, thereby reducing ground support personnel requirements. The incorporation of these systems will also eliminate the fire hazard created by the storage of over 3000 gallons of liquid oxygen on hangar decks and the servicing of aircraft oxygen systems prior to each flight.

Costs of this program are being shared equally with the Navy by the Air Force. The Navy is acting as lead laboratory for the development of the open system. Close coordination is being maintained with the Air Force throughout the continuing development of this concept. ◄

(Aviators will readily agree that the hazard control inherent in this system is well worth waiting for. – Ed.)

Anymouse



Suggestion

WHAT in the world are gray Navy vehicles doing on a busy naval air station's operating area (e.g. taxiways, crossing runways)? It's hard enough to taxi a 40,000-pound attack aircraft at night in IFR weather without having to contend with "camouflaged Navy trucks" scurrying about.

I suggest that *all* vehicles to be operated on an airdrome be painted *yellow* and be illuminated at night by adequate and conspicuous *colored* lights. In addition, if gray vehicles *must* be used on an airdrome, they should be marked by an appropriate orange-red/white flag in *good* condition (day only).

This is being written in Florida. But the above is applicable to just about every NAS ashore. "Let's get those gray trucks out of our hair and off our airdromes." (Quote from aviator friend.)

This is being written by a concerned air controlman who has many acquaintances in the flying fraternity. After hearing their complaints and suggestions and seeing it for myself from the tower, I felt someone had to let you know.

Towermouse

NAVMAT P-5100 Series, Section 0414, paragraph 1, directs that "all vehicles regularly used on landing areas, taxiways and aprons shall be painted and marked in accordance with NAVFAC P-300 (Series)" and paragraph 2 of that section states that "automotive equipment authorized on flying fields should be reduced to the absolute minimum." NAVFAC P-300, part V, table 2-1, note 5, states "all vehicles used exclusively on aircraft landing areas shall be painted yellow (no. 13538)."

Obviously, all cases of required vehicular traffic on the "landing areas, taxiways and aprons" are not covered, but the intent for absolute control of the vehicle hazard by commanding officers is perfectly clear.

Operations officers of all naval air activities are encouraged to review the applicable sections of the references noted and, where necessary, institute a critical survey of this continuing hazard area.

NAVMAT P-5100 Series
Safety Precautions for Shore Activities (Section 0414)
NAVFAC P-300
Management of Transportation Equipment (Part V)

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

REPORT AN INCIDENT
PREVENT AN ACCIDENT

It Flies

DID you hear the one about the H-46 on the line, parked between other aircraft, inadvertently becoming airborne?

Here's how. Seems it was dusk, and maintenance needed a turnup.

The last pilot was leaving the squadron area when he "volunteered" to make the turnup. After the blades were whirling the pilot leaned over to pick up something he had dropped. In doing so he banged the cyclic and the aircraft started to tip over. The pilot looked up and instantly realized what was happening. He yanked the helicopter level and up simultaneously, and when he found out he was safely airborne (no SAS, no lights, no radio), landed the bird and taxied back to the line.

The tower controller, who had not received any request for a helicopter launch prior to takeoff, had fits. His calls were never heard. Alert soul that he was, he passed the word quickly to security, while thoughts of stolen or hijacked helicopters filled his head.

Sometime later after everyone had calmed down (searchlights turned off, carbines stowed, crash crew back home) the story came to light.

I think it would be a good idea for turnup pilots to wear complete flight gear, preflight the bird every time, check the yellow sheets, and monitor tower frequency. It wouldn't be a bad idea to have some lights either. If these basic precautions were followed we would probably have fewer mishaps and less personnel injuries.

Scared Mechmouse

For a while, following this near-mishap, new turnup procedures will be instituted and pilots conducting turnups will not be discernable from those conducting flights.

Then, unfortunately, when things cool down, pilots will no longer strap in; then they'll stop informing the tower of the turnup; next, the radios will no longer be turned on – nor will the exterior lights. Then, the scheduled turnup pilot won't be available, and just before secure, a "volunteer" will go out to conduct the turnup.

Next thing you know, we'll receive an "Anymouse" relating the haphazard procedures leading up to another "preventable" accident.

While experience is, too often, the best (and most expensive) teacher – lessons learned are, too often, tragically* shortlived!** ***Keep hazard awareness high and risk acceptance low.

Soaked

AFTER signing the yellow sheet we walked to the SH-3 for a local training flight. Exterior preflight inspection was routine, however, as we entered the cockpit it was obvious the aircraft was not about to be flown. The interior was soaked because the plane captain had left the cockpit windows open during a heavy rain. Sure enough we had gyro, radio and generator discrepancies just as we suspected we would. This is a well-known problem in the H-3 and linecrews should be alerted to close all doors and windows when it rains.

Pilotmouse

You've said nearly all that can be said. Let's go one step further and ensure that doors and windows are closed if rain is imminent. ◀

He Knew the Route 'Cold'

MANY civilian aviation publications and some military magazines contain a page or two in each issue titled, "I Learned About Flying." Usually the stories recounted are Anymouse types wherein the pilot has a hairy tale to tell from which he learned a valuable lesson and passes along his experience to others. For what it's worth, most of the stories are delightful reading but it is seldom known whether or not the hairy tale influences others.

All pilots have read stories written about becoming lost, trapped, low on fuel, IFR (without a ticket), and other situations. These stories usually ricochet off the memory drum in the brain and are forgotten until a pilot finds himself in a like predicament. However, there is always the chance that such a tale will make enough impression to keep just one serious-minded individual from being caught in a similar bind. Here's one that will suffice until a better story comes along:

Two first-tour LTJGs launched in a UH-1B from their 'Nam maintenance base enroute to the detachment location about 100 miles away. Under most circumstances that means a flight of only an hour or so. However, in this instance they had two passengers to be dropped off about halfway, at an enroute fuel stop. Short hop. Onboard also were three other passengers, going all the way, and a crew of four. When you add in the weight of necessary survival equipment they had room for only 800 pounds of fuel. That was plenty to get to their first stop plus a conservative 15-20 minute reserve.

They departed without a weather brief and without any maps or charts. The HAC had made this trip over 25 times and knew the route cold – like downtown. About midway to their fuel stop, the pilots noticed bad weather ahead and noted also that their 80 KIAS didn't seem to be moving them over the terrain as fast as usual. The copilot suggested turning back, but the HAC decided to press on.

Passing over a well-known landmark, they took a DR cut for the fuel stop just as they entered broken clouds at 1000 feet AGL. If they had gone below the cloud deck, to remain contact, it would have subjected them to probable enemy ground fire; so they stayed IFR/VFR in and out of clouds, maintaining their altitude. (Before we go on, it *might* be legal to do this in Vietnam but no one would attempt this on a VFR clearance stateside, would he?)

Estimating that they were within 10 minutes of their fuel stop, a call to the tower was initiated, and they were cleared for an approach. A break in the clouds enabled them to see a village which looked familiar. A descent was begun, checklists were covered, and they called 3 miles out. The tower advised they were not in sight, and as they overflew the village it was obvious there was no airfield. A changing wind (and no doubt less than precise headings) had blown them off course. They were lost.

The 20-minute fuel warning light illuminated. Quickly they contacted the tower and asked if the radar was operating. It wasn't. It was used only at night. The pilots searched for any recognizable landmark because

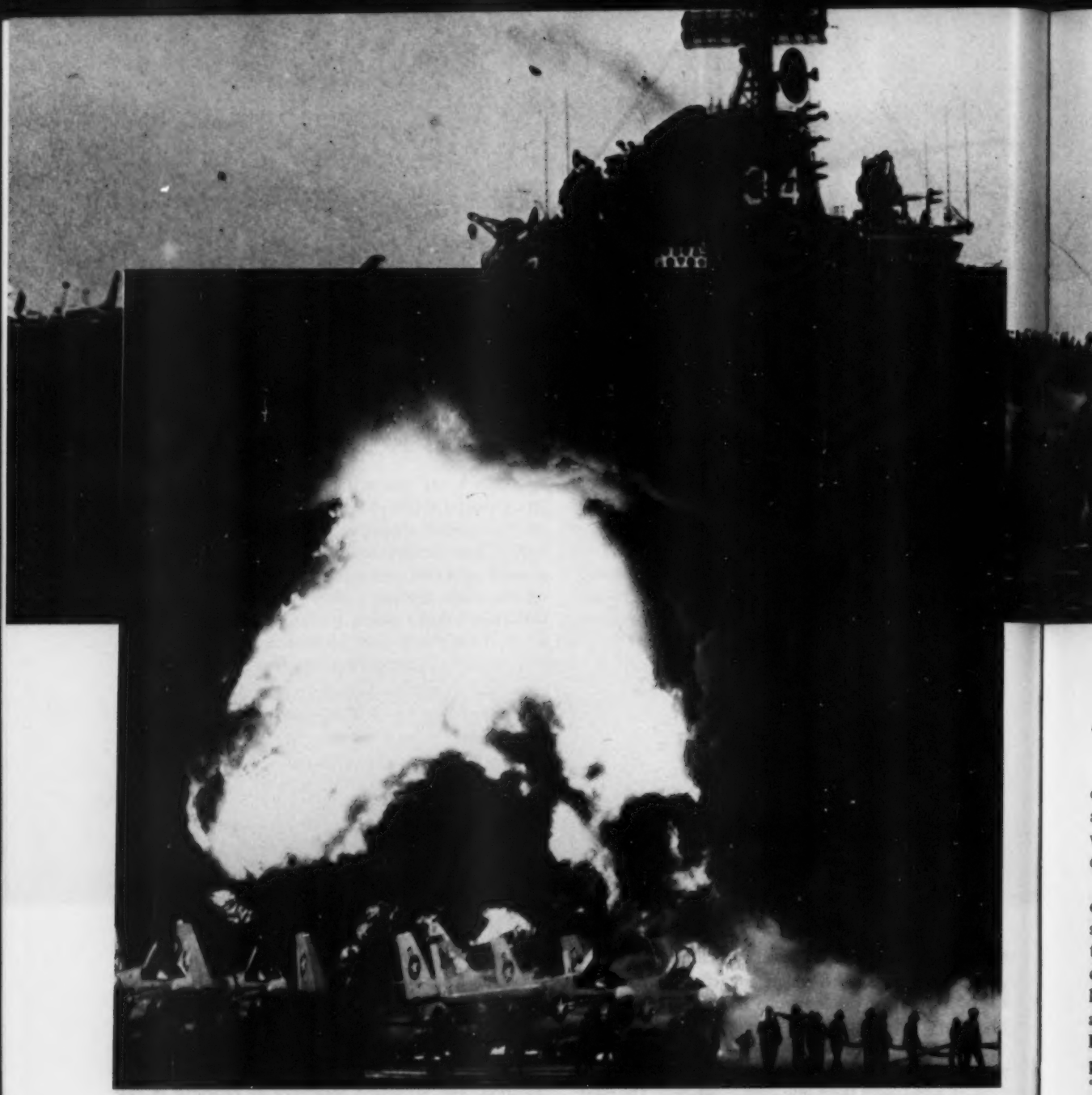
there weren't any navaids. It was eyeball reconnaissance or nothing. Pilots, crew chief, gunner and passengers were all looking to see if anyone saw anything familiar. No one recognized anything.

Ten minutes later they decided a controlled landing would be better than remaining airborne until the last drop of fuel forced them into an autorotation. The pilot picked out a landing zone which looked defensible, remembering that only a few days before, a helicopter had made a precautionary landing in the area and was destroyed by hostile fire.

As the approach was begun, the crew chief started yelling unintelligibly over the ICS. The pilot, thinking they were under fire, broke off the approach and climbed back into the clouds. It turned out that the crew chief had found a tattered, grease-stained section of a map in a rag storage box. Miraculously, the map was for the area they were in. The copilot spotted their position, plotted a course to the fuel stop, and estimated they could make it on dry tanks.

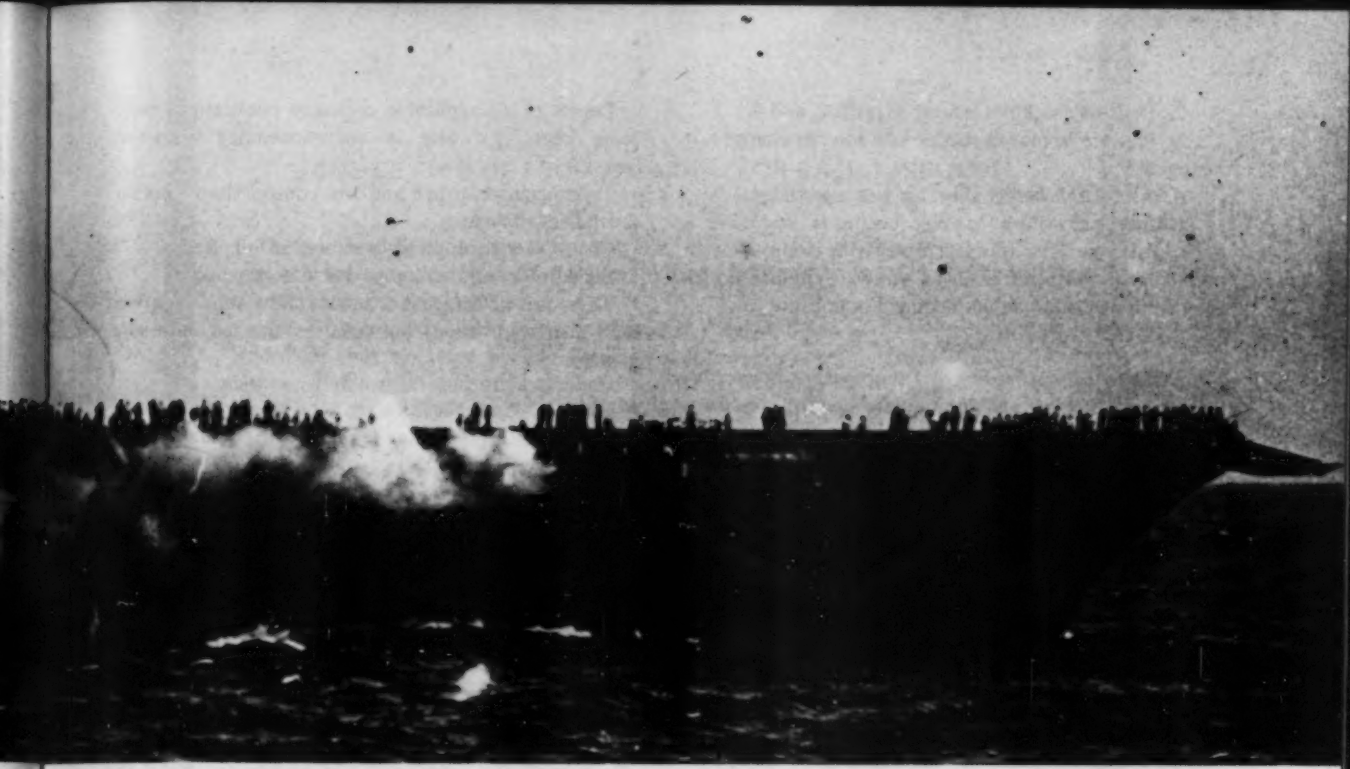
They elected to try it, called the tower giving their location, and requested assistance be provided in case they didn't make it. As it turned out, an uneventful landing was made after flying 22 minutes on a 20-minute light. *The fuel gage read zero.*

I mention this experience because now, as a second-tour pilot, I have a ready answer when my copilot wants to know why we take a complete nav bag on a local flight. Man, take those charts and maps, you might not be as lucky as I was.



Handling Ordnance is

DANGEROUS BUSINESS



Above: Tragedy aboard USS ORISKANY (CVA-34) caused by a mishap while handling Mk-24 parachute flares. *Left:* Flight deck holocaust aboard USS ENTERPRISE (CVAN-65) caused by jet starter exhaust in proximity to *Zuni* rocket warheads — *Lower right.*

DURING the past 4 years, there have been hundreds of ordnance mishaps leading to more than 200 fatalities and nearly 800 injuries. In addition, millions of dollars were lost in damaged or destroyed aircraft and other equipment.

It is normally concluded that personnel working with ordnance are highly proficient and thoroughly safety-conscious. Unfortunately, in some cases this is not true. NWEF (Naval Weapons Evaluation Facility), charged with the responsibility for publishing checklists, loading manuals and SRCs (Stores Reliability Cards), can attest to this. While visiting aviation units during their PDWST (Predeployment Weapons Systems Test), NWEF personnel found that some were not going by the "book." A few of the noted discrepancies are listed below:

Squadron A

Crews were not familiar with the release and control checklist. They had been using cards supplied with the ASM-20B vice *authorized checklist procedures.*

One crew fired a Mk-2 cartridge in an AERO 7 rack while installing a pylon on an aircraft.

One crew, trying to open the rack hooks with the safety pin installed, broke the shear pin in an AERO 7 rack.

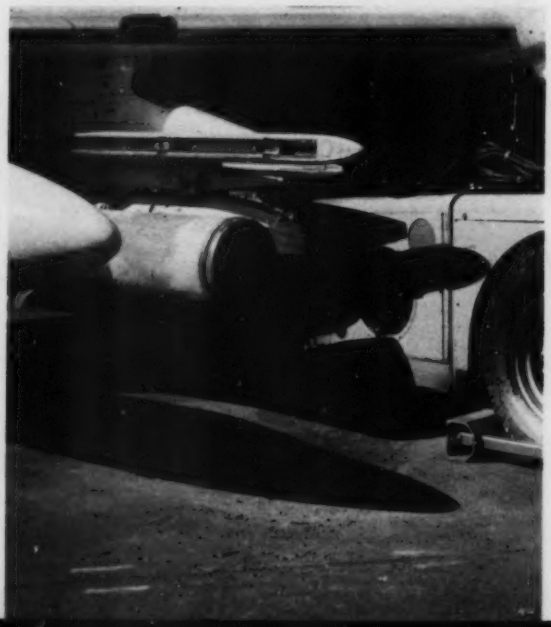
Squadron B

Checklists were not used by the crew during loading evolutions. The reason advanced for this was, "We never use them."

The NWEF inspector found checklists containing the following discrepancies:

1. Release and control checklist with interim change not entered.

Continued



2. Rockets checklists lacking pages 1, 2, and 4.

3. Practice bombs checklist with interim change not entered.

4. AIM-9 *Sidewinder* checklist was superseded.

During an AIM-9 loading evolution (without a checklist), the crew was asked when the nonpropulsion attachment was to be removed. Answers given were; "In the arming position; After loading; I'm not sure."

Squadron C

Statement from leading AO shop petty officer, "We don't use checklists and don't ever intend to," was made in the presence of the shop chief without rebuttal.

On the other hand, however, many aviation units breeze through PDWSTs and subsequent deployments by strictly complying with proper procedures. A couple of examples of units who did things right are shown below:

Squadron D

The inspector stated this was the best A-7 squadron he had ever visited.

The squadron used NAVAIR 01-700 (the checklist index) to its fullest extent.

The ordnance shop maintained two complete masters of all A-7 checklists, manuals, and SRCs, in addition to several additional copies of each filed in booklets for easy reference.

Copies of all applicable ordnance publications were being kept up-to-date in an outstanding ordnance library.

Training in ordnance and fire control shops was far above fleet standards.

The AO certification program was in full effect.

Squadron personnel took pride in their work.

There was no evidence of procedural disagreements as each man went about his tasks, as directed, in a safe manner.

Squadron E

AMAC system checks were good in all nine aircraft.

Checklists/SRCs were of adequate quantity and completely up-to-date.

Sufficient AERO 13B testers were available with SEC 1089 incorporated.

All test equipment was in calibration date.

Personnel were familiar with the conventional weapons release and control checks.

The cooperation and effort put forth by squadron personnel during the PDWST were both impressive and most commendable.

Eliminate Human Error

How can personnel caused ordnance mishaps be eliminated? The problem is not insurmountable if the following steps are taken:

- Ensure that key ordnance personnel are formally

Disaster aboard USS FORRESTAL (CVA-59) was the result of improper weapons arming techniques and stray voltage.

CNO LETTER OF PROMULGATION FOR EACH AIRBORNE WEAPONS/STORES LOADING MANUAL

The Airborne Weapons/Stores Loading Manual and associated excerpts are a positive approach to improve safety and reliability in the loading of conventional and nuclear weapons, and airborne stores.

The Conventional Weapons/Stores portion standardizes all respective loading procedures, but does not include flight procedures or tactical doctrine. If a conflict between this manual and other publications exists, the provisions of this manual shall prevail until the conflict is resolved by the Naval Air Systems Command.

Conventional Weapons Loading Checklists are abbreviations of procedures found in this manual and are intended for use in loading operations. It is not intended that aircraft rearming personnel be required to carry the Conventional Weapons Loading Checklist when such use is impractical. For use in the high tempo of operations areas an abbreviated SRC (Stores Reliability Card) has been promulgated. The SRC may be used in lieu of the Conventional Weapons Loading Checklist by trained and certified personnel. When the SRC is authorized for use in lieu of the Conventional Weapons Loading Checklist, its use is mandatory. The SRC is a laminated card of a size to fit into a pocket. The SRC will contain information to:

1. Ensure that the aircraft is ready to receive the weapon.
2. Ensure that the weapon is ready to be loaded.
3. Ensure that the weapon was properly loaded.
4. Show the final steps to prepare the weapon for flight and intended use.

The Nuclear Weapons portion of this manual standardizes respective loading procedures and includes inflight weapon procedures. If a conflict between this manual and other publications exists, the provisions of this manual shall prevail until the conflict is resolved by the Naval Air Systems Command.

Nuclear Weapons Checklists are abbreviations of procedures in this manual. These lists are directive in nature and their use is mandatory for aircraft nuclear weapons evolutions.

schooled and supervised to the point where they can apply correct ordnance procedures contained in checklists with knowledge and understanding. Whenever doubt exists concerning procedural steps, the verified weapons loading manual *must* be consulted.

- All personnel involved in ordnance functions should be certified in accordance with OPNAVINST 3571.3 and local directives. To be certified they must demonstrate to competent authority their proficiency in all phases of weapons handling, assembly, and loading, and be so certified by their commanding officer. Before getting involved in high tempo operations, personnel should use current checklists until they become completely adept at performing all ordnance functions.
- Ensure that certified experienced personnel involved in high tempo operations use, as a bare minimum, the SRCs prepared for these types of operations.
- Ensure that supervision is adequate and effective.

From what has been discussed thus far, it should be readily apparent that one of the most important aspects of ordnance handling is using the prescribed up-to-date checklists. Few personnel have the ability to remember everything contained in a checklist. Those who try to shortcut, place themselves and their shipmates in grave peril.

The Commanding Officer of the Naval Weapons Evaluation Facility (Kirtland Air Force Base, New Mexico 87117) is interested in your ordnance problems, both nuclear and conventional. He invites you to write (message UR) or telephone any suggestions for changes or additions to publications promulgated by his command. The AUTOVON number for NWEF is 946-3832.

Diligent attention to detail, training, supervision, and the use of correct publications is the key to safe ordnance operations. Be alert, be safe, and survive. ◄

The following article is based on an ASO's Anymouse report. It is presented in the hope of stimulating thought and discussion.

PHANTOM D

AN F-4J launched from a CVA in the late afternoon (just prior to sunset) on a routine CAP mission. However, during the course of the flight, a double generator failure occurred, making the flight anything but routine.

The pilot knew when he launched that the right generator had been griped for dropping off the line on two previous flights. On one of these flights the right generator had to be reset five times. The voltage regulator was changed and the gripe written off. The aircraft then flew two subsequent missions with no generator problems.

During the flight in question, the *left* generator failed 25 minutes after launch. The pilot requested an immediate recovery for three reasons:

- First, the dependability of the right generator was questionable.
- Second, there was still daylight, whereas, waiting for the scheduled recovery would entail a night approach and landing.
- Third, the failure of the left generator might be the first indication of impending loss of engine oil. (Note: When no evidence of oil loss was apparent, this possibility was discounted.)

Shipboard personnel, unaware of the previous gripes on the right generator, denied the request.

Fifty minutes after launch, the bus-tie opened and the right generator dropped off the line. The RAT was deployed and the pilot joined on the section leader. Rather than attempt a night approach and recovery on RAT power, the section headed for a divert field. However, when the right generator was successfully reset enroute, the section decided to return to the ship. Air Ops told the pilot to make a normal approach but the pilot, anticipating another generator failure, insisted on a section approach because of poor UHF reception previously experienced on RAT power.

The approach commenced, but as the section entered the undercast the right generator failed again. The pilot of the ailing *Phantom* pulled up, and the section became separated. After rejoining, a section approach was again commenced, this time on RAT power. From this point on, the pilot encountered problems not usually briefed for a double generator failure.

Cockpit air-conditioning, including anti-exposure suit cooling air, was inoperative on RAT power. As a result, the pilot was extremely hot and uncomfortable. In lowering the landing gear pneumatically, the gear handle must be held about 10 seconds until the indicators show

Double Generator Failure

the gear down. Without the use of his left hand to make power corrections, the aircraft crept ahead of the lead aircraft. For the same reason he couldn't transmit the problem to the lead. Since the aircraft is without external lights on RAT power, lead did not realize the position change. However, the pilot was able to regain his position after the gear came down.

Lowering gear and flaps pneumatically failed the utility hydraulic system. The pilot was faced with making a half-flap, undrooped aileron landing, with a consequent increase in approach speed of at least 20 knots.

Cockpit lights were dimmer than normal, making it difficult to read the flight instruments. The pilot, although short in stature, made it a practice to fly with his seat full down. It was his practice in the past to raise the seat just before landing; however, the seat could not be adjusted on RAT power. Realizing this, the pilot again reset the right generator, which stayed on the line just long enough to allow the seat to be raised.

The first approach was waved off because there was not enough wind over the deck to compensate for the increased landing speed. The aircraft boltered on the second attempt to trap, possibly because stability augmentation is inoperative on RAT power. The pilot later stated he felt he would not have boltered had he not encountered difficulty making lineup corrections without stab aug. The LSO's assistance was limited since there were no approach or external lights. The third approach ended in a successful arrestment.

Upon visual inspection of both CSDs and generator packages, the port CSD was found disconnected. The pin had sheared and the shaft backed out of the engine gearbox. The starboard CSD was checked and the frequency found to be unstable under load and upon acceleration and deceleration, causing erratic operation.

This incident might well have been an accident. If the aircraft had boltered a second time, lack of fuel would have been a consideration. Refueling in the dirty configuration under ideal circumstances is not a big problem, but throw in pilot anxiety, fatigue, a hot and sweaty poopy suit, unfamiliarity with tanking at night in the dirty configuration, inoperable stab aug, no IFR probe light, and you have a major problem fraught with accident potential.

In short, yes, the pilot should have declared an emergency. BUT, with darkness coming on, bringing all of the usual night carrier landing limitations with it, command and control in the ship (with the F-4 squadron reps at hand) should have recognized the potential and taken this sortie aboard as requested. ◄

DURING its recent safety standdown, Fighter Squadron THIRTY-TWO published the two fictitious letters shown below. It was done to emphasize the need for better communications between maintenance personnel and flight crews. As the VF-32 ASO said in his covering letter, "A check of writeups and writeoffs in most any squadron could lead you to believe that these two characters actually exist." We'd like to think he's wrong, but . . .

Gittin' the Message

Dear Maintenance Guys,

You clucks just ain't gittin' the message. The following is a list of descrepancies I wrote up the last hop and they ain't fixed yet. You lazy birds don't do nothing but scratch and laff and play cards.

1. Airframes – The hydraulic pumps is acting up, I think. It sounds like a hydraulic pump going out to me.
2. Powerplants – One of the engines don't seem to be running just right. I forgit which one so you better check them both.
3. Electricians – Gyro off flags pop out on cat shot.
4. Ordnancemen – I pulled the trigger and the bombs stayed on the plane.
5. AT's – Tacan broke lock every time I flew over the ship.
6. AQ's – The radar still don't work, no picture.
7. AME – Checked emergency O_2 only had 8 minutes worth. If you guys don't git off yours and fix these planes I'm gonna see the head man and he'll have yours as He and I are good buddies.

Yours for better communications,

IMA H. S. Flyer

Across

Dear H. S. Flyer,

IAW Maint Dept policy of ans all req for info about act tak on rpt squawks each of ur gripes and act taken is listed no matter how minor or chicken they are.

A/F – *PC#1 press went to zero after 30 mins of flight* . . . (this gripe is really nitpicking). Serviced system. Checks 4.0 on the deck same as it has the last 10 times.

P/P – *Port engine runs rough with evidence of fire* . . . (They still haven't spotted the aircraft so we can turn it). Checks good visually – next pilot check.

AE – *Gyro tumbled on cat shot* . . . Checks 4.0 on deck. (If it won't quit for us we can't fix it can we?)

AO – *Could not release bombs or jettison TER's* . . . Other aircraft had same problem. Suspect bad lot of Mk-82 bombs. (Just to show we are really interested we are writing a UR on that lot of bad bombs.)

AT – *Tacan azimuth and DME inoperative and OFF flag stays ON* . . . Unable to check on deck since ship's tacan is unreliable. (You could use the radar and ADF you know.)

AQ – *Presentation fuzzy with no discernable targets in operate* . . . Bit checks good. (To show how hard we try to please you guys, 90 percent of the boxes we pull on your nitpicking imaginary gripes get sent back to us A799 from IMA.)

AME – *Unable to eject from either front or rear cockpit* . . . The cables from the primary and secondary ejection handles were disconnected. (That DS we sent to QA missed this on preflight and you didn't catch it either.)

As you can see we have thoroughly checked all your complaints, most of which are really minor UP squawks that you really shouldn't take up our important time with. The insinuation that you would go directly to the big boy himself wasn't missed. We happen to have some pictures of him with some honey his wife would just love to see.

Yours for good and safe flying,

Your Maintenance Crew

Compliments of
Fighter Squadron THIRTY-TWO

April 1972

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SAGE GREEN

THE 'IN' LOOK

By Alan S. Hellman,
Naval Air Development Center

THE FASHION magazines tell us that this is the Year of the Accessory and that the well-dressed man will continue to pay more attention to this part of his wardrobe in the future. So what about Navy/Marine pilots and aircrewmen?

New sage green nomex ventilated wet suit coveralls, summer and winter flying coveralls, and anti-G coveralls are making the scene. Sage green will be the "in" color this year, although olive is still in vogue.

OPNAVINST 3710.7F, General NATOPS, states that the latest in authorized aircrew personal protective

equipment or flight safety and survival equipment can be found in the Aircrew Personal Protective Equipment Manual, NAVAIR 13-1-6.7. Chapter 2 details the latest in clothing and equipment configurations authorized for optimum protection without sacrificing operating ability for each weapons system.

The truly "in" configuration also includes all the latest equipment modifications. But what about the accessories – those items which Navy and Marine aviation personnel usually refer to as personal survival equipment?

Ad Hoc Committee

In the latter part of 1969, CNO established an ad hoc committee of user and technical personnel to set up requirements for personal stowage of survival equipment. The ad hoc committee's recommendations were the beginning. The end product was the CNO-issued survival requirement lists which accompany this article.

The primary purpose of this entire survival equipment program is to improve man-mounted stowage techniques. The thinking behind the program is that need or requirement should control standardization rather than standardization being the controlling factor. Perhaps the most important point stressed by the CNO ad hoc committee was the necessity for giving *each* individual in *each* crew station in *each* weapons system, separate treatment in the design of equipment or stowage techniques. All survival equipment efforts will be weapons system/crew station-oriented rather than standardization-oriented.

At the time of the committee's establishment, the trouble with the SV-2A survival vest stowage concept was that it concentrated too much bulk in the wearer's chest area. Since over 98 percent of all rescues are accomplished in less than 10 hours and a 24-hour SAR capability exists, a different approach to personal survival equipment was possible. In formulating this approach, three basic questions were asked:

1. *Which survival items are required for an effective survival capability?*
2. *Which of these items must be man-mounted?*
3. *How should these items be carried and how should they be integrated into each personal configuration for each aircraft type?*

Representative Attendance

In March 1970, the committee met to take a look at these problems and to recommend changes. Attending were representatives from all type aircraft communities and all type commands. These included staff personnel, squadron COs, safety and NATOPS officers, pilots, aircrewmen, aviation survival equipment men, and representatives from APTUs (Aerospace Physiology Training Units) and training activities. A comprehensive report was issued in October 1970, and CNO issued survival equipment requirements in June 1971.

As established by CNO, a formal review of survival equipment requirements will be scheduled every 2 years. The next conference will take place in late 1972 or early 1973. At that time, changing survival equipment requirements based on changing missions or technological advancements will be discussed.

Variety of Factors.

In development of the optimum compromise on what equipment to carry, a variety of factors had to be considered. Among them were mission profile, flight duration, crew station configuration, comfort, SAR availability, egress capability, type clothing worn, technological advances, safety, maintenance, and probable access to auxiliary survival equipment.

In establishing survival equipment requirements, generally speaking, equipment designated for man-mounting has been kept to a minimum. Most of the man-mounted items represent detection equipment which will be needed for immediate use in a survival situation. The five-pound limit on additional survival equipment to meet special environmental needs is still in effect.

Continued

Some Equipment Eliminated

Some equipment has been eliminated by changing conditions. For example, based on a realistic 24-hour SAR capability, it is now more practical to carry a small ready-to-use water supply, if any at all, rather than a device for "making" larger quantities of water. For this reason, the solar still is no longer required, and the desalter kit will be phased out. Along the same line of thought, chemical shark repellent, if needed at all, is required immediately after water entry, prior to boarding the liferaft. Hence, the shark repellent should be man-mounted but carried only on overwater flights where the presence of sharks is highly probable.

Implementation Planned

The ad hoc survival equipment committee also made plans to implement the revised requirements and procedures. While new concepts are being evaluated, data packages are being developed and documentation prepared for introduction to the Fleet. Cognizant supply personnel are already working on the supply and data package actions necessitated by the new requirements.

Ideally, changes in related equipments should occur at relatively the same time. On the other hand, urgently needed actions might be ready for introduction before the longer range, more complex tasks are completed.

It is for this reason that the following information on major actions is presented.

Directives

The Master Survival Equipment Chart and all man-mounted equipment requirements have been included in Chapter 2 of NAVAIR 13-1-6.7 (Change 2). All non-man-mounted equipment requirements (multiplace liferaft and LR-1 liferaft equipment package requirements) and stowage data are being included in Change 1 to NAVAIR 13-1-6.1, Inflatable Survival Equipment in the Air Crew Systems Manual series.

An Aircrew Systems Directive to cover all configuration changes is in the final stages of preparation. The directive references requirement lists and other information detailed in NAVAIR 13-1-6.1 and NAVAIR 13-1-6.7 and presents seat kit packing instructions.

At the present time, an SV-2A improvement directive is in the works. This directive will remedy the major problems encountered with the vest. The same information will be included in the next change to NAVAIR 13-1-6.7.

A directive detailing addition of a helo lift capability to the SV-2A vest for non-torso harness users has been prepared. Studies are underway which will lead to optimum equipment stowage concepts. A new and improved vest which can be optimally used by many pilots and aircrewmen is being evaluated. Along the way, flight suit stowage concepts as an alternate to vest stowage concepts have been evaluated and rejected, primarily because a compartmentized garment, such as the vest, keeps you from accidentally leaving a piece of gear behind.

Helicopter Aircrewmen

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Stowage concepts for pilots or aircrewmen wearing body armor are currently the subject of a Tri-Service development effort. Special interim efforts are in the final stages.

Allowable deviations based on unique requirements are presently defined in OPNAVINST 3710.7F, General NATOPS.

One last word – for maximum successful use of personal survival equipment, periodic practice and familiarization by pilots and aircrewmen are essential.

* Chaps, similar to those used by cowboys, will be worn over normal flight clothing.

MAN-MOUNTED EQUIPMENT – HELICOPTER VERTICAL REPLENISHMENT (VERTREP) AIRCREWMEN

Item	Quantity
(Minimum Required)	
Flare Gun MK 79 Mod O	1
Signal Light (Strobe) SDU-5/E	1
Distress Signal (Day/Night) MK 13 Mod O	2
Survival Radio	1
Whistle	1
Wrist Compass	1
Survival Knife	1
SEEK-2 or SRU-31/P Kit	1
Signal Mirror (Small)	1
Dye Marker	1
(Optional)	
Shark Repellent	1

NOTE:

The signal light (steady burning) 761-A may be substituted for the signal light (strobe) SDU-5/E at the discretion of the local commander.

MAN-MOUNTED EQUIPMENT – MULTI-ENGINE LAND BASED/LONG DURATION AIRCRAFT PERSONNEL

Item	Quantity
(Minimum Required)	
Flare Gun MK 79 Mod O	1
Signal Light (Strobe) SDU-5/E	1
Distress Signal (Day/Night) MK 13 Mod O	1
Survival Radio	1
Whistle	1
Suspension Line Cutter	1
Survival Knife	1
Pen Light	1
Signal Mirror (Small)	1
(Optional)	
Extra Distress Signal (Day/Night) MK 13 Mod O	1
Wrist Compass	1
Water Bottle 4 oz.	1 or 2
Pistol and Ammunition	1
SEEK-2 or SRU-31/P Kit	1
Dye Marker	1

NOTE:

It is not necessary that all personnel be equipped with a survival radio or pen light. Those carrying the survival radio should use a wrist compass.

MAN-MOUNTED EQUIPMENT – HELICOPTER PASSENGERS (NON COMBAT)

Item	Quantity
(Minimum Required)	
Dye Marker	1
Distress Signal (Day/Night) MK 13 Mod O	1
Whistle	1

NOTE:

A light source shall also be provided.

MAN-MOUNTED EQUIPMENT – MULTI-ENGINE CARRIER BASED/SHORT DURATION AIRCRAFT PERSONNEL

Item	Quantity
(Minimum Required)	
Flare Gun MK 79 Mod O	1
Signal Light (Strobe) SDU-5/E	1
Distress Signal (Day/Night) MK 13 Mod O	1
Survival Radio	1
Whistle	1
Wrist Compass	1
Suspension Line Cutter	1
Survival Knife	1
Pen Light	1
Dye Marker	1
Signal Mirror	1
(Optional)	
Extra Distress Signal (Day/Night) MK 13 Mod O	1
Water Bottle 4 oz.	1 or 2
Pistol and Ammunition	1
Shark Repellent	1
Personnel Lowering Device	1
Area Map	1

NOTE:

The signal light (steady burning) 761-A may be substituted for the signal light (strobe) SDU-5/E at the discretion of the local commander.

Continued

Some Equipment Eliminated

Some equipment has been eliminated by changing conditions. For example, based on a realistic 24-hour SAR capability, it is now more practical to carry a small ready-to-use water supply, if any at all, rather than a device for "making" larger quantities of water. For this reason, the solar still is no longer required, and the desalter kit will be phased out. Along the same line of thought, chemical shark repellent, if needed at all, is required immediately after water entry, prior to boarding the liferaft. Hence, the shark repellent should be man-mounted but carried only on overwater flights where the presence of sharks is highly probable.

Implementation Planned

The ad hoc survival equipment committee also made plans to implement the revised requirements and procedures. While new concepts are being evaluated, data packages are being developed and documentation prepared for introduction to the Fleet. Cognizant supply personnel are already working on the supply and data package actions necessitated by the new requirements.

Ideally, changes in related equipments should occur at relatively the same time. On the other hand, urgently needed actions might be ready for introduction before the longer range, more complex tasks are completed.

It is for this reason that the following information on major actions is presented.

Directives

The Master Survival Equipment Chart and all man-mounted equipment requirements have been included in Chapter 2 of NAVAIR 13-1-6.7 (Change 2). All non-man-mounted equipment requirements (multiplace liferaft and LR-1 liferaft equipment package requirements) and stowage data are being included in Change 1 to NAVAIR 13-1-6.1, Inflatable Survival Equipment in the Air Crew Systems Manual series.

An Aircrew Systems Directive to cover all configuration changes is in the final stages of preparation. The directive references requirement lists and other information detailed in NAVAIR 13-1-6.1 and NAVAIR 13-1-6.7 and presents seat kit packing instructions.

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One last word – for maximum successful use of personal survival equipment, periodic practice and familiarization by pilots and aircrewmen are essential.

* Chaps, similar to those used by cowboys, will be worn over normal flight clothing.

MAN-MOUNTED EQUIPMENT – HELICOPTER VERTICAL REPLENISHMENT (VERTREP) AIRCREWMEN

Item	Quantity
(Minimum Required)	
Flare Gun MK 79 Mod O	1
Signal Light (Strobe) SDU-5/E	1
Distress Signal (Day/Night) MK 13 Mod O	2
Survival Radio	1
Whistle	1
Wrist Compass	1
Survival Knife	1
SEEK-2 or SRU-31/P Kit	1
Signal Mirror (Small)	1
Dye Marker	1
(Optional)	
Shark Repellent	1

NOTE:

The signal light (steady burning) 761-A may be substituted for the signal light (strobe) SDU-5/E at the discretion of the local commander.

MAN-MOUNTED EQUIPMENT – MULTI-ENGINE LAND BASED/LONG DURATION AIRCRAFT PERSONNEL

Item	Quantity
(Minimum Required)	
Flare Gun MK 79 Mod O	1
Signal Light (Strobe) SDU-5/E	1
Distress Signal (Day/Night) MK 13 Mod O	1
Survival Radio	1
Whistle	1
Suspension Line Cutter	1
Survival Knife	1
Pen Light	1
Signal Mirror (Small)	1
(Optional)	
Extra Distress Signal (Day/Night) MK 13 Mod O	1
Wrist Compass	1
Water Bottle 4 oz.	1 or 2
Pistol and Ammunition	1
SEEK-2 or SRU-31/P Kit	1
Dye Marker	1

NOTE:

It is not necessary that all personnel be equipped with a survival radio or pen light. Those carrying the survival radio should use a wrist compass.

MAN-MOUNTED EQUIPMENT – HELICOPTER PASSENGERS (NON COMBAT)

Item	Quantity
(Minimum Required)	
Dye Marker	1
Distress Signal (Day/Night) MK 13 Mod O	1
Whistle	1

NOTE:

A light source shall also be provided.

MAN-MOUNTED EQUIPMENT – MULTI-ENGINE CARRIER BASED/SHORT DURATION AIRCRAFT PERSONNEL

Item	Quantity
(Minimum Required)	
Flare Gun MK 79 Mod O	1
Signal Light (Strobe) SDU-5/E	1
Distress Signal (Day/Night) MK 13 Mod O	1
Survival Radio	1
Whistle	1
Wrist Compass	1
Suspension Line Cutter	1
Survival Knife	1
Pen Light	1
Dye Marker	1
Signal Mirror	1
(Optional)	
Extra Distress Signal (Day/Night) MK 13 Mod O	1
Water Bottle 4 oz.	1 or 2
Pistol and Ammunition	1
Shark Repellent	1
Personnel Lowering Device	1
Area Map	1

NOTE:

The signal light (steady burning) 761-A may be substituted for the signal light (strobe) SDU-5/E at the discretion of the local commander.

Continued

MAN-MOUNTED EQUIPMENT – FIGHTER, ATTACK AND TRAINER PERSONNEL

Item	Quantity
(Minimum Required)	
Flare Gun MK 79 Mod O	1
Signal Light (Strobe) SDU-5/E	1
Signal Mirror (Small)	1
Distress Signal (Day/Night) MK 13 Mod O	1
Survival Radio	1
Whistle	1
Wrist Compass	1
Suspension Line Cutter	1
Survival Knife	1
Pen Light	1
(Optional)	
Extra Distress Signal (Day/Night) MK 13 Mod O	1
Water Bottle 4 oz.	1 or 2
Pistol and Ammunition	1
Shark Repellent	1
Personnel Lowering Device	1
Area Map	1

NOTES:

The signal light (steady burning) 761-A may be substituted for the signal light (strobe) SDU-5/E at the discretion of the local commander.

Although the requirement exists for a man-mounted personnel lowering device, the existing device is seat kit mounted due to its size and weight. A more compact device is being developed for man-mounted application.

MAN-MOUNTED EQUIPMENT – HELICOPTER RESCUE CREWMEN

Item	Quantity
(Minimum Required)	
Distress Signal (Day/Night) MK 13 Mod O	2
Suspension Line Cutter	1
Survival Knife or Pneumatic Webbing Cutter	1
Signal Light (Steady Burning) 761-A	1
(Optional)	
Dye Marker	1
Signal Mirror (Small)	1
Whistle	1
Shark Repellent	1
Flare Gun MK 79 Mod O	1

NOTE:

The pneumatic webbing cutter if available may be carried as the primary cutting device. Otherwise, the survival knife should be carried as a back-up device for the suspension line cutter.

MAN-MOUNTED EQUIPMENT – HELICOPTER PILOTS, COPILOTS AND OTHER AIRCREWMEN

Item	Quantity
(Minimum Required)	
Flare Gun MK 79 Mod O	1
Signal Light (Strobe) ADU-5/E	
Dye Marker	1
Signal Mirror (Small)	1
Distress Signal (Day/Night) MK 13 Mod O	2
Survival Radio	1
Code Card	1
Whistle	1
Wrist Compass	1
Survival Knife	1
SEEK-2 or SRU-31/P Kit	1
Pen Light	1
(Optional)	
Water Bottle 4 oz.	1 or 2
Pistol and Ammunition	1
Shark Repellent	1
Light Weight Space Blanket	1
Area Map	1

NOTE:

The signal light (steady burning) 761-A may be substituted for the signal light (strobe) SDU-5/E at the discretion of the local commander. ◄

Flying in HIGH DENSITY Areas

By LCDR J.R. Howard

FOR the single-seat jet type or the multimotor aviator, a transit through a high density traffic area is an interesting, challenging experience.

Those who fly daily in high density areas have become accustomed to frequent routing changes, enroute delays, and low altitude airways, but to the transient, a 30-minute flight in these complex areas can be a frustrating and, quite often, frightening experience.

Take the New York area, for example. To get the picture in perspective, take a look at an L-27 low altitude FLIP chart, and note that Kennedy, Laguardia, Newark, Philadelphia International, McGuire AFB, NAS Lakehurst, NAS Willow Grove, and NAF Warminster are all jammed together in an area about 80 miles in circumference. Now envision the innumerable general aviation airports in this circle, and you see the problems which a controller in a high density area faces.

A flight into any high density area can be as routine as a local in south Texas *if* you are ready for it; if not, it can become a nightmare you'd rather forget.

The first item in any flight is planning:

- Study the charts of the area (high, low and terminal). Don't get caught fumbling for a low altitude chart when the controller suddenly drops you out of APC and clears you to hold at a low altitude intersection.
- Be prepared for a low altitude assignment many miles prior to reaching your destination. Outbound traffic may be climbing in your direction and the controller may want you down early so you won't meet head on.
- If the destination weather is IFR, be prepared for holding as far as 150 miles from destination. When the weather gets sloppy, you may find 50 to 75 aircraft waiting their turn in holding. Check your fuel planning and allow for an *extra* reserve.
- Check your CNI (Communication, Navigation and Identification) gear thoroughly. If you have intermittent radios or your IFF suddenly becomes inoperative, change your destination. You will become an unwanted commodity if you try to fly in a high density area without an IFF.
- Follow clearances to the letter, and fly the airways like a professional. Nothing hurts our image more than an aviator who allows himself to deviate off centerline because of poor airmanship.
- Be courteous with the controller. Don't get upset if he is curt in his clearances. He's as busy as you are, and unnecessary chit-chat is unwanted. Listen up for your radio call, and follow proper voice procedures to the letter.

When it's time to depart the area, follow a few simple rules in filing:

- File in the direction of traffic flow. Ask some locals which is the quickest airway out. Don't try to file the wrong way on a one-way street.
- File your flight plan at least 1 hour prior to departure so that it will have plenty of time to reach the computer, and your departure time can be confirmed. Remember, you're a non-sked, and you have to be fitted in with the departures of American, Pan Am, Eastern, Lufthansa, etc.
- Make good your departure time. Be ready to go when you are radar released. It's your slot, so get in it, and get out of the area ASAP.
- Be prepared for unaccounted delays. Someone up the road may have goofed up your slot and you will just have to wait until they can fit you in. Don't yell at the tower operator; he didn't do it and you won't help by asking the reason for the delay. Twenty minute delays are not uncommon.

Now that you are enroute home, it wasn't bad at all, was it? The little extra time you spent planning was worth it. You may even feel your ego boosted a little because once again you operated in a "hostile" environment and came through like a pro. ◄

If you have a question concerning any phase of instrument flight for which you cannot find a satisfactory answer, send it to Commanding Officer, VA-127, NAS Lemoore, Calif. 93245, who has volunteered to do the necessary research and supply the answers.

ON THE GLIDE SLOPE

Best Method for Enroute Turns

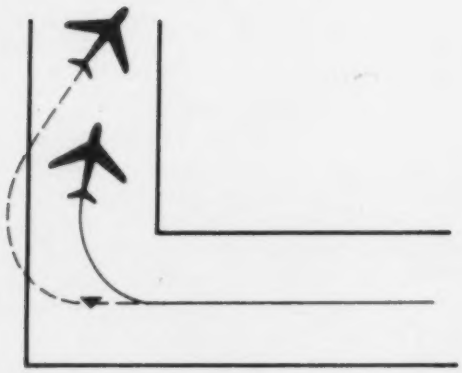


Fig. 1

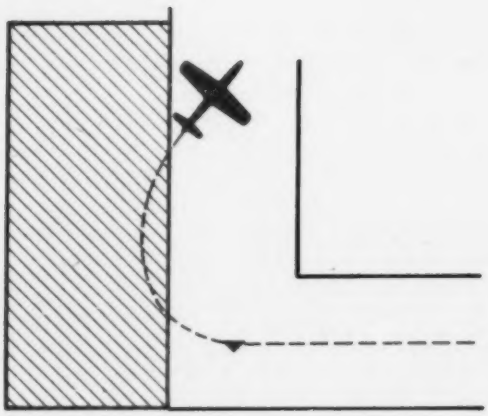


Fig. 2

EARLY TURN ———

TURN AT OR AFTER FIX PASSAGE – – – –

WE are frequently asked, "What is the best method for turning over a TACAN station enroute? Should the aircraft obtain station passage and then turn to intercept the outbound radial, or should turns be led using DME?"

Both methods are illustrated in Fig. 1. If the turn is not commenced until over the station, an aircraft with a 5 mile turning radius will reach a point 5 miles off the centerline of the airway/route being flown (90 degree change of heading). FAR 91.123 requires pilots to operate along the centerline of an airway or route. Part 1 of the Airman's Information Manual further explains that when course changes are required, the turns should be led using any available cockpit instrumentation, such as DME.

The amount of lead will, of course, depend on several variables including the degree of turn, aircraft turn radius, and wind. For turns in excess of 90 degrees we recommend using the lead computed for a 90 degree turn and then taking a "cut" to intercept the outbound course. This method will avoid turning through unprotected airspace on the inside of the turn.

Some aircraft are not DME equipped and therefore are unable to lead turns. For these aircraft, ATC will protect airspace as depicted in Fig. 2. The amount of airspace protected will vary with altitude. For further information refer to the Enroute Air Traffic Control Manual, 7110.9B, under lateral separation. ◄

TAIL ROTOR EMERGENCIES

By LCDR T. F. Doyle Jr., USN

TAIL rotor malfunctions are the most serious emergencies that may confront a helicopter pilot. They can be classified into two distinct groups – drive failures and control failures.

Unfortunately, most NATOPS manuals fail to present a clear and concise discussion of all the factors which the pilot must consider when handling tail rotor emergencies. They cannot be handled "by the numbers." Immediate recall of NATOPS procedures *is* required, but understanding the aerodynamics of the problem and good pilot judgment are equally important.

Each helicopter has handling characteristics peculiar to the model. However, the basic aerodynamic principles in tail rotor emergencies are the same for all single rotor helicopters having a main rotor which turns in the conventional direction.

This article contains many ideas which are presented for thought and readyroom discussion. It is published for the purpose of increasing general knowledge concerning causes, effects, and pilot techniques during tail rotor failure. The opinions and recommendations are personal – the author's.

Drive failure is the loss of the tail rotor thrust vector caused by shaft, gearbox, or blade failure (by definition. – Ed.). It is more serious than control failure because inability to recognize the malfunction and initiate immediate corrective action will result in the helicopter entering uncontrolled flight.

The procedures for handling drive failures at low altitude are adequately covered in most NATOPS manuals. However, the discussions of the procedures for handling tail rotor drive failures in cruise flight are generally too brief. An expansion of given procedures tailored to the types of missions flown should be developed within each operational organization. Some considerations for this development follow.

Continued

Ultimate drive failure is often preceded by symptoms such as high pitch whining, unusual vibrations felt in the cabin and cockpit deck, shaking rudder pedals, tail rotor gearbox chip light illumination, an odor of metal-to-metal friction, and thin gray smoke emanating from the tail section. When any of these symptoms occur, it is important to land as quickly as possible and unload the tail rotor.

A running landing on the nearest smooth surface is preferred or a reduced power, no-hover landing if a running landing is out of the question. The objective in a precautionary landing with tail rotor drive problems is to minimize stress on the tail rotor system. This is accomplished by using minimum collective pitch throughout the running landing. A hover landing can precipitate ultimate failure at an inopportune moment. A failure while approaching a hover landing is difficult to handle because of low altitude and high-power settings. At least one accident on record attests to the fact that application of hover power to a helicopter with known tail rotor drive problems can cause the tail rotor system to fail.

If a precautionary landing cannot be executed because of rough terrain or water, maintain at least 1000 feet to permit an unhurried autorotation entry in case ultimate failure occurs enroute to a safe landing area. Prepare for ditching by requesting assistance, assuming optimum autorotational airspeed, jettisoning external stores, and turning on the landing light if at night.

Ultimate tail rotor drive failure is unmistakably detected by a sudden yaw to the right – as much as 70 degrees depending on the power setting and airspeed. This sudden yaw is often preceded by a loud snap, and left rudder will have no effect. At the moment of failure, pilot judgment is a significant factor. If a pilot is flying either the H-3 or the H-53, his only course of action, short of bailing out, is to execute an immediate autorotation and landing regardless of the terrain. If he is flying an H-34, H-2, or certain series H-1, he has an option of attempting to fly the helicopter to a position over smooth terrain or possibly to the nearest airport by applying left cyclic and sufficient power to maintain altitude.

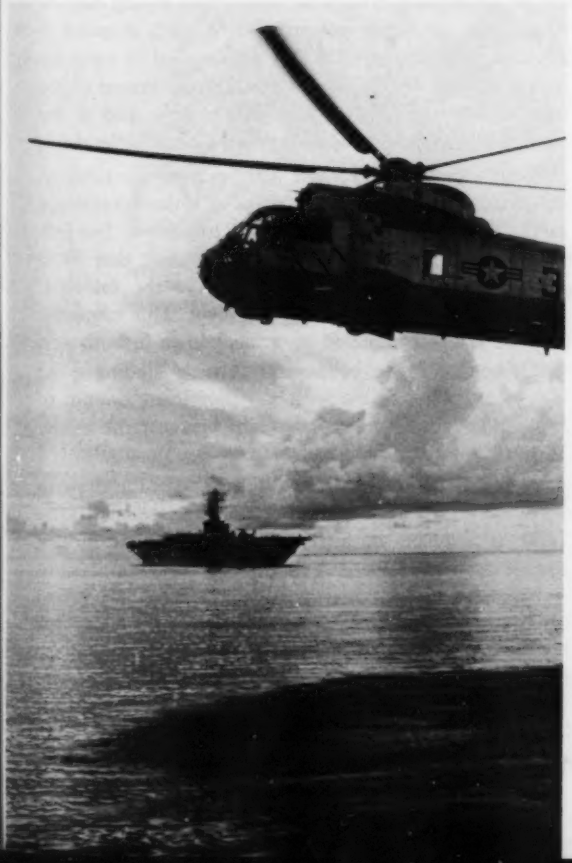
Before selecting this option, however, the pilot should conduct a quick but keen appraisal of the suitability of the terrain for landing. This appraisal is necessary because helicopters purported to be capable of powered flight without tail rotor drive, may not have this capability under conditions of high gross weight or unusual CG location. The cost of testing this capability in extremis is *altitude* – something which may be very precious. Additionally, the tail rotor drive loss may have been caused by loss of the entire tail rotor assembly and successful powered flight under these conditions is highly improbable. Albeit this feat has been performed twice – once in an H-34 (see APPROACH July 1962) and once in an H-3.

Attempted powered flight without tail rotor thrust is a desperate last resort to avoid autorotating into rough terrain or water. Successful powered flight without tail rotor drive relies on counteracting the yawing moment created by torque applied to the main rotor. The force of the airstream on the skidding fuselage neutralizes the torque delivered from the main rotor to the fuselage in powered flight. (An outstanding discussion of the technique required may be found in the April 1964 issue of APPROACH.) A botched attempt at powered flight could prove disastrous. Therefore, when ultimate drive failure occurs, an immediate autorotation is usually the best course of action.

An important point made in the 1964 article warns pilots against right-hand turns when conducting powered flight without tail rotor drive. Left turns are preferable because airspeed is easily lost and sink rate increased in right turns. Several years ago a UH-1B pilot successfully recovered from tail rotor drive failure in cruise flight using power technique only to spin in during a right turn toward homefield.

It is noted that the *SH-3D NATOPS Manual* states that "... entry into autorotation (following loss of tail rotor drive) will reduce the yaw angle to about 40 degrees." *Perhaps loss of the entire tail rotor assembly would result in such a yaw after autorotation entry.* However, I experienced a sheared intermediate gearbox in cruise flight in the SH-3D, and while the yaw at the moment of failure was severe, there was no yaw in evidence once autorotation was commenced.

Transmission friction force tending to yaw the nose left in autorotative flight is sometimes a factor in lighter helicopters. This tendency can be largely offset by use of a small lateral cyclic input, and by executing a running autorotative landing when terrain permits.



Loss of the entire tail rotor assembly may complicate matters, but use of the autorotative descent is the best available corrective action to cope with loss of tail rotor thrust, regardless of the reason for the loss: In autorotation, the transmission is not delivering torque to the main rotor, and hence, there is no opposite torque applied to the fuselage. Any small torque effects in evidence are due to transmission friction. With the condition in autorotative flight of negligible torque being applied to the fuselage, the need for tail rotor thrust is minimized. There is really no pilot action available which attacks the problem in a more direct manner than autorotation.

Some series H-1 helicopters can be landed without tail rotor drive by executing a powered running landing. This procedure involves trading RPM for yaw control, and is indeed useful in handling certain tail rotor control failures. However, full autorotation remains as the most positive action available to the pilot experiencing loss of tail rotor drive. While autorotative flight minimizes yaw, the absence of normal yaw control causes the helicopter to weathercock slightly when landed crosswind. Thus it is very desirable to land into the wind. However, if the altitude and relative position of the wind line requires a large and rapid cyclic turn, a compromised landing heading should be selected. Large cyclic turns will

dissipate airspeed and increase the rate of descent.

A running autorotative landing is preferred, but do not hesitate to shoot a zero groundspeed landing if dictated by the terrain.

The possibility of tail rotor drive failure exists on virtually every flight. However, study, preplanning, and a lot of autorotation practice can make your next tail rotor drive failure an incident instead of an accident.

The key to success is recognizing the symptoms, knowing your options, and taking immediate and positive action. *The time to prepare for this emergency is now.*

Tail Rotor Control Failure

Tail rotor control failure is defined as the inability to execute normal control over the pitch of the tail rotor blades. (Some ASE and servo malfunctions may initially appear to be tail rotor control problems.) When confronted with this emergency, take time to determine precisely the true nature of the emergency, and the limitations of yaw control. To avoid unpleasant surprises during landing, conduct an unhurried analysis before commencing an approach to the runway.

Most NATOPS manuals neglect to offer a detailed explanation of how to land the helicopter after a genuine tail rotor control malfunction. The following techniques have been used with success in the UH-1B and the aerodynamic principles involved are applicable to all single-rotor helicopters.

A tail rotor control malfunction is manifested by a lack of complete left or right rudder authority – no yaw response when using rudder. Lack of rudder authority may be simulated by applying and holding right or left rudder in cruise flight. Full deflection of the rudder pedal is delayed until airspeed is reduced during approach. Sudden and full rudder application in cruise flight will cause structural failure. Pilots must be cautious to avoid exceeding sideslip limits of the helo.

Lack of left rudder authority (right rudder applied) may be compensated for by reducing main rotor RPM. An approach to a running landing is begun at normal RPM. As collective pitch is increased to cushion the running landing the nose will yaw to the right due to lack of sufficient left rudder authority. Continue reducing altitude down to about 2 feet and reduce airspeed until the yaw approaches 45 degrees. Then slowly reduce main rotor RPM, holding the helicopter off the surface until the nose has rotated left to the landing direction. An improperly executed maneuver results in the helicopter landing with some yaw. Skid-equipped helicopters are more forgiving of this mistake. In wheel-equipped helicopters the danger of flipping over when landing with yaw precludes completion of this maneuver to touchdown in a training situation. However, there is much training value in conducting the RPM reduction maneuver at altitude, and in practicing approaches to a runway without RPM reduction or landing.

In helicopters not equipped with a throttle on the collective stick, completion of this maneuver requires the copilot to operate the throttles, and to work in close coordination with the pilot. If this coordination has not been practiced, a high-speed running landing may be preferable to main rotor RPM reduction. A drawback of a high-speed running landing is the control difficulty experienced in slowing down because of the yaw associated with reduction of torque to the main rotor.

Lack of right rudder authority (left rudder applied) may not be compensated for with adjustment of main rotor RPM. Theoretically, increased RPM would compensate for limited right rudder authority, but since normal operating RPM in most helicopters is relatively close to max RPM, the theory is not applicable in practice. Fortunately, increased collective pitch in powered flight has nearly the same effect on fuselage turning moments as increased RPM.

A left yaw must be accepted during the approach, but will begin to disappear as collective pitch is applied when the helicopter is slowed to a low altitude air taxi. There is a collective pitch setting which will cause the nose to point down the runway, and this is the pitch setting with which the helicopter must be landed. The setting may be very close to hover power. As the taxi airspeed is reduced, collective pitch is slowly increased to keep the helicopter just clear of the surface. The movement of the nose to the right is watched very closely, and at the moment of alignment with the runway, the collective is reduced slightly to place the helicopter on the runway. As the collective is further reduced toward minimum pitch, the fuselage will again tend to yaw to the left. This yaw is no problem with skid landing gear. With wheel landing gear it is best to have the tailwheel unlocked to allow the fuselage to pivot. This maneuver may be safely completed to a touchdown in both skid and wheel-equipped helicopters because landing speed always approaches zero with any significant amount of left rudder applied to simulate the loss of right rudder authority.

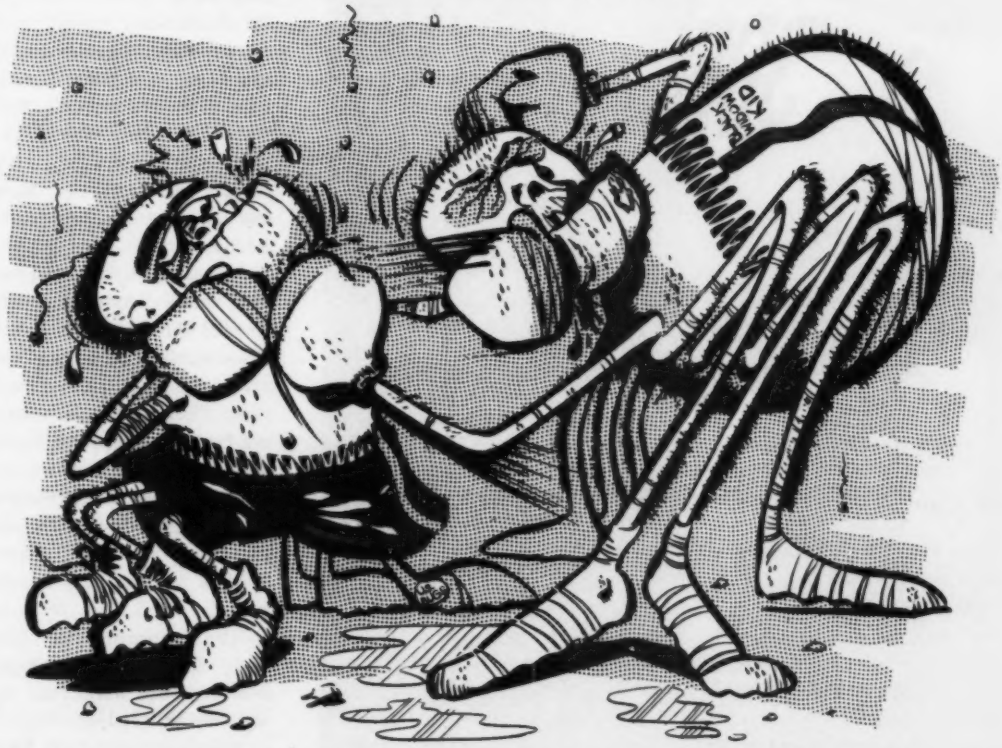
With lack of right rudder authority, do not hesitate to wave off a bad approach. (The only exception is after RPM is reduced in a limited left rudder authority approach. When RPM is reduced, you are committed to a landing.) The alternative of not waving off a bad approach is landing in a skid which may cause the helicopter to flip over. Naturally, yaw is going to be experienced during some part of the waveoff and subsequent approach. The yaw is no problem if the pilot

is aware of the nature of his emergency (the yaw does not occur as a surprise). This is why it is necessary to determine the nature and degree of control loss before commencing the initial approach.

To the pilot who has never thought very much about control failures, who has never taken the time to plan his troubleshooting and flight procedures, the harsh test of an actual tail rotor control failure can be very confusing and alarming. No pilot can say when he might be tested. The professional helicopter pilot accepts the fact that he operates in an environment that may suddenly impose severe threats to his survival. He knows that readiness to meet these threats requires that he constantly expand his knowledge of the aircraft, and develop his flying skills.

Recognizing the symptoms of the various types of tail rotor emergencies and being able to execute the required corrective action are hallmarks of the professional helicopter pilot. ◄

Mortal Encounter



DURING a recent safety survey held by a Naval Safety Center Survey Team the following item was among those covered in the critique at the conclusion of the safety survey: "Fuel line on engine in hangar is lying on deck and contaminated by bugs and speedy dry." As the Safety Center representative who made the comment was preparing to depart the scene of the survey, he was handed the following memorandum:

"Due to the serious nature of the discrepancy noted by you in the check hangar (fuel line contaminated by bugs and speedy dry) an intensive investigation has been conducted. The following facts were discovered:

1. A small bug, species undetermined, entered fuel line while attached to the aircraft.
2. A large spider, species also unknown, followed shortly thereafter.
3. A terrible fight ensued which caused the fuel line to fall to the deck.
4. Personnel witnessing the above rushed to the scene with speedy dry to absorb the blood.
5. Unfortunately the graves detail had not removed the mortally wounded combatants from the battlefield prior to your arrival." ◄

TA-4F Canopy Loss

"THE PROTECTION provided by the helmet visor cannot be overemphasized."

This comment comes from the rear seat occupant of a TA-4F which lost its canopy in flight shortly after takeoff.

Prior to the aircraft's positioning on the duty runway, the canopy was down and locked. The canopy light was out, the four locking lugs were visually checked, the canopy locked indicator pin was extended approximately 1/8th of an inch, and the rear seat was in the full down position. The ejection seat control lever was in the up position.

Shortly after takeoff, as the aircraft passed through 220 KIAS, 10 degrees left bank, and 1000 feet AGL, the canopy raised slightly to about the "mousetrap" position. It stopped for a fraction of a second, then separated from the aircraft.

The pilot immediately reduced power, lowered the gear and flaps, and commenced dumping fuel as he turned downwind for an emergency landing, accomplished without incident.

The squadron included the rear seat occupant's narrative of events in its abbreviated aircraft incident report "to alert all persons concerned with the extremely dangerous conditions which exist in the rear seat upon loss of canopy."

"The effects of the windblast were immediate," the rear seat occupant states. "The first effect was an abrupt difficulty in breathing caused by the onrushing airstream which created suction around the oxygen mask and, as it passed, drew the oxygen out. I countered this with deep, slow breathing, opening my mouth occasionally . . .

"The cockpit was rapidly swept clean of all loose items. Even the kneeboard was stripped."

In such circumstances, the narrator emphasizes, *do not* attempt to save anything. At 160 to 200 KIAS, the airstream is strong enough to pull an arm out of the cockpit. An arm flailing against the seat could trigger an inadvertent ejection.

"Since there was no protection from the airstream, the brunt of the air was directed to my face," he reports, describing the excellent protection provided by his helmet visor. "Even with the visor down, my eyelids were peeled back by the wind, although shutting my eyes tightly helped to lessen the effect. My attempts to avoid the airstream by tilting my head down only resulted in stiff neck muscles the next day."

The airstream also lifted his body slightly off the seat. This, however, was minimized by good tight lap belts, adjusted beforehand.

Communication was impossible because of the noise of the wind and the engine. The rear seat occupant's attempts to contact the pilot were largely ineffective.

In summary, the squadron report states, the loss of a canopy in the TA-4F totally incapacitated the rear seat occupant. Provided the seat is fully down, lap belts tight, and mask and visor firmly secured, a successful ride to a final landing is probable. The possibility of inadvertent ejection exists,

however, making proper body position throughout the incident imperative. Unnecessary movements should be avoided.

One final note, the report concludes.

"If the oxygen mask is blown off by the airstream, breathing will be difficult if not impossible. Egress via the alternate ejection handle should be considered."

All canopy operating procedures, preflight and postflight inspections of the canopy system, ejection seat control lever positions, and ejection seat procedures were reviewed during a safety standdown less than 2 weeks before the incident. The squadron CO believes this review contributed significantly to the professional manner in which this most dangerous situation was successfully concluded.

The aircraft did not have AFC 419 installed. This modification provides for a rifle bolt lock which holds the canopy on – an improvement over the original configuration.

Training Pays

"I RECOGNIZED a situation of an aircraft in extremis, in danger of an immediate crash, and I reacted almost automatically. I thought about trying to beat the ejection seat but could not move my arms fast enough. Upon chute deployment, again I reacted automatically. I grabbed the risers, bent my knees, hit relaxed and rolled into the drift.

"I feel that my training throughout my career served me well."

A-4 pilot after ejection

Rhovyl Underwear

Before . . . and After: On the right is a pair of Rhovyl Clevyl T polyvinyl chloride (PVC) drawers designed to be worn under the ventilated wet suit coverall. On the left is a similar pair *after* a pilot *accidentally* sent them to the ship's laundry. He tells us they not only shrank to midget size but are now hard instead of soft.

NAVAIR 13-1-6.7, Aircrew Personal Protective Equipment Manual points out that the PVC underwear must be washed as a wool item in water at a mild temperature. The garment can be tumbled dry at a low heat setting. (Hanging the drawers to dry stretches them.) The manual warns that, as the owner of the outfit pictured above learned the hard way, PVC underwear washed incorrectly will be unwearable.

FOD SQUAD

at NAS Albany

EVER since the day jet engines made their debut in naval aviation, FOD has been a nemesis of devilish proportions. Over the years, NARFs and AIMDs have had to rework and repair thousands of jet and gas turbine engines due to foreign object damage. What really hurts is, most FOD is caused by *carelessness*.

Much has been spoken and written concerning man-hours and dollars wasted because of FOD. We may be overlooking the obvious in not frequently detailing the outstanding FOD control programs instituted and practiced by many of our naval aviation activities.

In this article we're going to present a rundown on what one such activity, NAS Albany, is doing to effectively combat and reduce foreign object damage.

In October 1970, AMS2 S. L. Rozier, attached to NAS Albany AOMD (Air Operations Maintenance Division) decided to do something to reduce FOD. He was dissatisfied with the inadequate walkdown procedures which were being used. The existing method consisted of performing an "all-hands" walkdown of the involved apron area each morning. However, FOD walkdown ramp personnel were not assigned designated areas nor held accountable for the removal of foreign objects.

NAS Albany, like most naval air stations, services many aircraft models daily on its transient line. It's

AMS2 Rozier using FOD can.

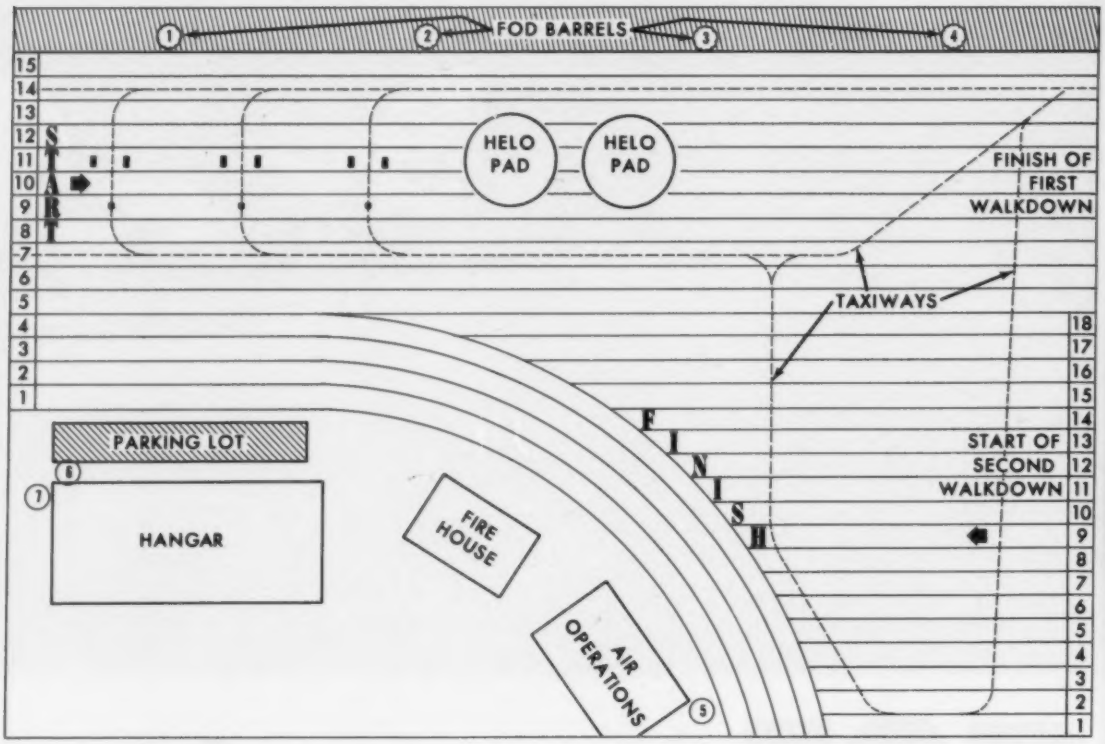


Fig. 1

conceivable that during the year every model aircraft in the Navy's inventory, plus many from other military services use Albany's transient line facilities. This places FOD control high on the air station's priority list.

On most air stations, the ramp areas are made up of connecting concrete squares. Rozier's plan eliminates the guesswork normally involved in coordinating an effective FOD walkdown, by numbering each row of connecting squares (see Fig. 1). FOD bags with numbers matching those of the concrete rows are then assigned to designated individuals who are expected to assume full responsibility for removing FOD from their particular rows. The bags are hung from a board located in the FOD control center (see photo to right). The center is situated in an area where maintenance personnel are constantly reminded of the hazards associated with foreign object damage.

In addition to the daiiy FOD bags, there are also four weekly accumulation bags hanging on the right side of the board in the FOD control center. At the end of each week, debris collected in the 18 daily bags is transferred to a weekly bag and retained for a period of 5 weeks.

Some of the benefits provided by the NAS Albany FOD program are:

• A minimum of personnel are required to ensure complete FOD walkdown coverage.

• Timely and detailed identification of FOD material is possible.

• Analysis of FOD material to determine how it got there, where it came from and if possible what corrective action can be taken to ensure it doesn't show up again.

• Retained FOD material can be photographed for use in local FOD posters.

The program is supervised by a FOD PO assigned from the QA division. He maintains a daily FOD log which contains the time, date, and type of control conducted (walkdown, inspection, sweeper, etc.). As stated earlier, the program is simple and requires no lengthy indoctrination period for newly assigned personnel. Additionally, other responsible shop petty officers can manage the program in the absence of the FOD PO.

From all appearances, the program is enthusiastically accepted by all maintenance personnel because it:

• Assigns specific responsibility for all apron areas.

• Provides for total coverage and eliminates skipping or overlapping areas.

• Allows personnel a more active participation in the program by having them see an actual accumulation of the FOD pickup.

• Eliminates the requirement for all assigned walkdown personnel to rewalk their areas because one or two others may have failed to do a thorough job during their initial walkdown. An inspection by the FOD PO or other supervisory personnel after a FOD walkdown will easily identify areas in which anyone was remiss.

Other measures used by NAS Albany to eliminate FOD are: 43

• Tool accountability program. Toolboxes stamped with FOD reminders (see photo).

• No hats allowed on the line (except sound attenuators).

• "Free of FOD" Stamp on MAFs signed by CDIs (see photo).

Continued

• FOD cans with locally manufactured "stay-shut" lid (see photo) strategically located around the apron areas.

There you have it – a good look at NAS Albany's FOD control program. We think it is a mighty effective approach to gaining a marked reduction, or total elimination, of foreign object damage. We know there are many other naval aviation activities with programs equally as effective, and we say to them – keep up the good work. Those individuals or activities who would like more information concerning the NAS Albany program should address their request to:

Commanding Officer AUTOVON 860-3246/7
NAS Albany
Attn: AOMD Officer
Albany, Georgia 31703 ◄

Safety Tip

EXPEDIENCY is no excuse for compromise. Recent ordnance mishaps cited by CNO and reemphasized in CINCLANTFLT msg 100046Z (NOTAL) required review of weapon system maintenance practices, ordnance loading procedures, and pilot weapons system expertise by all NAVAIRLANT commands. *Weapons system maintenance must be performed in accordance with NAVAIR directives under strict, unyielding quality assurance supervision.* Aircraft loading shall be accomplished using applicable NAVAIR checklists. Report weapons systems shortcomings *immediately* so that system safety hazards may be eliminated. Ensure pilots know their weapons systems so that inflight malfunction analysis may reduce the possibility of inadvertent releases.

COMNAVAIRLANT *Weekly Safety Bulletin*

LETTERS

Once there was a man who called a spade a spade until he fell over one he had left on the cellar steps.

Safety Review

Parachute Flare Kit

NAS Ellyson Field – Recently one of our aircraft was forced to make a night autorotation. There was a full moon and the visibility was unlimited, thus enabling the pilot to find a field. Unfortunately, the pilot had to stretch his glide at the last minute when he observed powerlines in his path. The aircraft sustained strike damage, and there was one minor injury. If the moon had not been full or the sky clear, the outcome could have been worse.

We have heard of a parachute flare kit, designed for helicopter use during night autorotations and other emergency landing situations. The device is called a Schermully flare and is used by Royal Air Force and Royal Navy units. Although we have no detailed data, apparently the device is installed on the tail pylon on the side opposite the tail rotor. There are two flares per kit, mounted in a fashion so that when actuated the flares are deployed aft and above the aircraft.

The procedure is to fire the first flare at the onset of the emergency while the aircraft is at altitude, thus enabling the pilot to choose the most favorable area below. The second flare is actuated passing through 1500 feet, which enables the pilot to continue the descent to land in near daylight conditions.

If you feel as I do that this device could be used to enhance the safety of night helicopter operations, please pass this letter along to an authority which can proceed with evaluation and procurement for fleet units.

LT A. Reiner, USNR
HT-8

• We have a photo which illustrates a launching position other than the one you describe. Two flares are mounted on the tailwheel yoke assembly and fire forward and slightly up. The picture is a Royal Navy *Westlake*, similar to our H-34. We have forwarded your letter to NAVAIRSYSCOM recommending a feasibility study.

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request.

Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, Va. 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

One Bailed Out

FPO, New York – Re your December issue of APPROACH, "One Bailed Out," I must comment. Being a multiengine pilot of medium vintage (2500 hours), I have always believed that it is most essential to differentiate between two-engine and four-engine aircraft emergencies. In a four-engine aircraft . . . you can afford the luxury of being too quick to feather. In a plane such as the S-2, I strongly believe, and I taught my students in advanced training to believe, that normally they should wait for *two* indications of engine trouble prior to feathering. Why? Just to make sure the engine with one bad indication is actually going to fail and also to make sure which engine is going to fail. How farfetched is it to believe that two gages could be installed reversed? Or two lights? The article, as it reads, is a classic to bring home exactly this point. There would have been six ground kissers instead of five had subject aviators complied with the above.

LT C. D. Shields, Jr., USN
USS ROOSEVELT, V-2 Division

Continued

● **First of all let's see what the S-2 NATOPS manual says.**

> "If a fire-warning light comes on and the engine malfunctions cannot be determined by a visual check of the engine instruments, the pilot in command must use sound judgment in making the decision to feather or not to feather . . . If the light remains on and circumstances permit, serious consideration must be given to feathering."

(Kind of weasel-worded, isn't it?) Now jump into the cockpit. You're the pilot in command with five other souls onboard; the fire-warning light comes on, and stays on. Up to this point *both* engines have been operating normally. What course of action follows from the moment of the emergency depends on the experience, judgment, and pucker level of the pilot in command. The pilot in the story did a 180, advised Center of his "trubs," and elected to feather. His passengers were alerted, and when his *good* engine let go, he restarted the one he had originally feathered. Meanwhile, with the safety of his passengers in mind, he ordered them to bail out. During the interval between *no engines* and *restarting the feathered one*, a passenger hit the silk. When the man says go, someone has to be first out!

Lamenting the Lament

Washington, D.C. – The undersigned, having been "crunchee" for many tours and "crunchor" for one tour each, take exception to the "Safety Officer's Lament" printed on page 5 of the January 1972 issue of APPROACH.

In our individual experiences, there is no group in the Navy which works harder or longer than the aircraft handling crew on an aircraft carrier.

To indicate that blue shirts get their kicks, tilly drivers laugh, or deck bosses will get them all today, is a slur on those unsung producers who are showing what Navy aircraft carriers can do in the Med, Westpac and all over the world.

Agreed, there are some ridiculous crunches just as there are some ridiculous incidents or accidents involving flight (pages 15 and 20-23 of the same issue). However, in our experience the great majority of crunches have been due to the speed and number of aircraft movements necessary to make the schedule. Some of these movements caused, incidentally, by the requirements to replace an "up" aircraft which, after being spotted for launch, was downed by the previous pilot.

We realize, or at least hope, that the "Safety Officer's Lament" was written with tongue in cheek – if not, maybe the safety officer would get a different outlook if he spent a few 14 to 18-hour days as a blue shirt on the sundeck of the bird farm.

We don't want to leave the impression that we condone or excuse crunches – we emphatically do not. Our sole purpose is to point out that we know of no crunches about which tilly drivers laughed or from which blue shirts got kicks. All have been studied, the cause covered with all hands, and methods to avoid them stressed.

Let's praise rather than deride those who make it possible for us to do our job.

CAPT R. S. Chew, Jr., USN
CAPT W. T. Laws, USN

● **Your assumption that the lament was written with tongue in cheek is entirely accurate. Matter of fact, there were several "tongue in cheek" involvements since the verse was written by a triad of ASOs from an Oceana Air Wing. Anyone in the business of flying on and off carriers would be the last to ridicule the troops in colored shirts.**

Presenting aircraft crunches in a humorous manner can be attributed to nothing more than an expression of the utter futility and frustration that many a "crunchee" and "crunchor" has endured.

We hope that an occasional humorous approach to an otherwise grim business can have positive results in getting the message of accident prevention across.

Ruba-Dub-Dub!

FPO, New York – As a safety officer I'm a solid supporter of safety shoes for all hands, not just maintenance personnel or aircrew but *all* naval personnel. The following incident took place not in the hangar or on the line but in the home of an enlisted man.

This individual had two buddies help him install a new bathtub in his home. During installation, the bathtub, weighing approximately 300 pounds, slipped and smartly landed on his right foot. Fortunately, he was wearing his Navy-issued safety/flight boots, and safety prevailed.

This incident testifies to the need for safety shoes in *all* hazardous situations. No matter where it happens, an injury can put a man out of work. People are the most important asset in our Navy. Why can't all hands get safety shoes?

LT W.F. Savage, USN
VS-24

● **Increased use of safety shoes has been endorsed by the Naval Safety Center for the past several years. Most recently (last summer), NAVSAFECEN recommended to CNO that safety shoes (FSN 8430-928-6386 series) be made available to all shipboard personnel either as uniform allowance items or through automatic shipboard distribution. It was further recommended that the general purpose work shoe (FSN 8430-904-4635 series), when existing stocks are exhausted, be replaced by the safety shoe.**

Prior to this recommendation, CNO had approved the Navy Uniform Board's decision to continue the present system of issuing safety shoes (issue as deemed necessary at command level).

In view of additional information on the insulating properties of the safety shoe and the general purpose work shoe presented by NAVSAFECEN, CNO requested the Chief of Naval Personnel to review the new data and make recommendations.

This safety shoe prevented injury when a 300-pound bathtub fell on the wearer's foot.

As of this writing, no final decision has been made. We'll keep APPROACH readers posted on developments.

Blade Curling

NPRO Philadelphia, Pa. – I've got to confess, your photo of a F-4U *Corsair* Wheels-Up on page 24 of APPROACH, November 1971 issue has me going around in circles.

I can't figure out the unusual curling of the left-hand propeller blade.

Photo from the article "Then and Now." *Then, as now,* unintentional wheels-up landings were 100 percent pilot error.

Although it would appear only that the LH blade is curled in the wrong direction – that is actually correct for the normal R-2800 propeller rotation. (Counter-clockwise I determine.)

How then could the propeller sustain that damage unless possibly the negative was reversed (?) and the damage to one blade was caused by "kick-back"? I'd love to have an explanation if you can help – we're all stumped here.

LCDR D. A. Mohr, USN

• Note the position of the blade shanks and edges – almost as if the prop had been feathered. All blades were bent opposite to engine rotation during initial contact with the runway. This contact also stripped the pitch control gear teeth inside the prop hub. Subsequent contact during final slide resulted in the vertical and the right-hand blades flipping 180 degrees from the faired ("feathered") position. Note that the camber of vertical and right-hand blades is opposite that of the left blade.

You Made Our Day

Merriam, Ks. – During a TAD assignment at NAS North Island for an SP-2 checkout in early 1967, I became formally introduced to aviation safety and APPROACH. My assignment was unique in that I was among the first Army pilots to receive this training. Although belated, I would like to convey my appreciation for the professionalism and safety awareness of the officers and men of the North Island detachment of VP-31.

They received the Army pilots as their own, introduced us to your excellent safety publications, and explained that NATOPS was the only answer to the operation of the P-2. They dressed us in their flight clothing and removed us from our hobnailed boots. The plane captains taught us everything they knew about the aircraft and spent many of their off-duty hours doing so. Safety was constantly stressed by every member of the squadron. Since then, APPROACH has been my favorite aviation safety publication. I read it cover to cover and continue to applaud its thought-provoking articles.

The military is constantly called upon to set the example, and I think the Navy does this with expertise as evidenced by the men of VP-31 and the articles printed in APPROACH. I salute the Navy for officers like LT C. E. Wiedeman (author of "Copilots are Alive and Well," APPROACH December 1971), and APPROACH for its contribution toward accident prevention.

In closing, I would be remiss if I didn't make a suggestion. Due to the varied background of readers, i.e., Army, Air Force and civilians, I would suggest an explanation within the articles to provide a means of deciphering the Navy jargon so often used. Although I personally have little difficulty in understanding articles, I feel I have an advantage in that I had a rewarding 1½ years association with naval aviation. This, however, is the exception rather than the rule. Keep up the good work.

CW4 James A. Bell, USA

• We attempt to make APPROACH understandable to all readers but acknowledge that we do use considerable Navy jargon, abbreviations, and acronyms without explanation. We'll watch it in the future.

Helicopter Escape System

NAS Pensacola – I am a 1st LT in the Marine Corps presently assigned as a flight student in jet training. I am also working on my master's degree in aeronautical systems at the University of West Florida. This quarter I am doing a study on helicopter escape systems from both an engineering and aerospace medicine approach.

I have read the article in the December 1971 issue of APPROACH by CWO Williams, USMC, and would greatly appreciate any additional information you could send me on helicopter escape systems.

1st LT Paul V. Duncan, USMC
BOQ 3252, Room 328B

• A presentation was made at NAVSAFECEN on this subject by LT Baker from Naval Weapons Lab, Dahlgren, Va. in December 1971. It concerned a proposed escape system for the AH-1J Marine attack helo. Basically, it is a simple explosive system which takes about .75 second to operate. The charges sever the MRB and blow the canopy before the gunner and pilot eject. It is low risk, has high reliability and a 10-year life. It would cost about $15,000 per installation, weighs 145 pounds, and would require about 18 months to produce and install. The latest report we have is that coordination between Army and Navy is being conducted to make this a joint project.

If you are overweight,
chances are you're suffering
from an overactive fork.

Ace L.

Vol. 17 **approach** No. 10

RADM W. S. Nelson
Commander, Naval Safety Center

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

Contents

Departments

NavAir 00-75-510

Purposes and policies: Approach, published monthly by the Naval Safety Center, presents the most accurate information currently available on the subject of aviation accident prevention. Contents should not be considered as regulations, orders or directives and may not be construed as incriminating under Art. 31, UCMJ.

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Credits

"Business As Usual" might well be the title of this month's cover painting by staff artist Blake Rader showing the Navy's *Crusader* being launched on its mission of vigilance. **Pg 31** Photo: PH3 Charles Norden. **Pg 32** APPROACH diagram by Don Lips. **Pg 40-44** Photos: NAS Albany. APPROACH diagrams **Pg 42, 43** by Don Lips.

Safety and NATOPS

AN INCIDENT recently happened in Southeast Asia which proves a very interesting point. An attempt was made to lure an innocent young H-53 driver into using his external hook to tow a truck which was stuck in the mud. Fortunately for all concerned, the pilot declined the invitation and wisely so. The external hook on most helicopters is designed to lift in the vertical plane only. It is not properly stressed for heavy loads either fore and aft or laterally.

While it is true that *Sikorsky* has indeed developed towing gear for the H-53, such equipment is not currently in use in the Fleet Marine Force. It is significant to note that during actual towing operations, the cable is strung internally (not externally) through the cargo door with the ramp down. It is also important to know that the use of any old cable at hand is unacceptable. The only cable approved thus far is one which is specially designed to minimize backlash should the cable fail.

There is little need to mention the consequences were the cable to part and, for example, whip up around the rotor head. Towing operations, to date, have been conducted mostly at altitudes below 100 feet and attitudes approaching 20 degrees nose down (with RAD ALT HOLD on). Quite obviously the pilots involved should be highly trained before attempting this type of maneuver. So much for towing.

It is incumbent upon the squadron ASO to continuously remind his fellow aviators not to undertake operations beyond either *their* capabilities or those of the equipment they are using.

The prudent pilot knows both his capabilities and his limitations. Wisely, he won't bite off more than he can chew. Had the pilot mentioned in the above instance undertaken the mission, he could easily have damaged his aircraft or caused death and serious injury. Something called *common sense* told him not to take part in the tow mission.

Since there was no damage, the ASO had a problem as to how to disseminate the word to other intrepid aviators throughout the Corps. A *Safety UR* wouldn't really have been appropriate, since nothing on the aircraft failed. However, another avenue of approach was available – NATOPS. *Urgent Change Recommendations to any NATOPS publication can be made by priority message.*

In this case the NATOPS Flight Manual does not cover towing via the external hook. Therefore, the Urgent Change Recommendation would actually be an addition in the form of a *Warning*. If all the users are info addressees, then the ASO's task is accomplished through NATOPS. The point is, safety and NATOPS can and do work hand in glove.

MAJ H. A. Gideonse
Operations Officer
MAG-56

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There is little need to mention the consequences were the cable to part and, for example, whip up around the rotor head. Towing operations, to date, have been conducted mostly at altitudes below 100 feet and attitudes approaching 20 degrees nose down (with RAD ALT HOLD on). Quite obviously the pilots involved should be highly trained before attempting this type of maneuver. So much for towing.

It is incumbent upon the squadron ASO to continuously remind his fellow aviators not to undertake operations beyond either *their* capabilities or those of the equipment they are using.

The prudent pilot knows both his capabilities and his limitations. Wisely, he won't bite off more than he can chew. Had the pilot mentioned in the above instance undertaken the mission, he could easily have damaged his aircraft or caused death and serious injury. Something called *common sense* told him not to take part in the tow mission.

Since there was no damage, the ASO had a problem as to how to disseminate the word to other intrepid aviators throughout the Corps. A *Safety UR* wouldn't really have been appropriate, since nothing on the aircraft failed. However, another avenue of approach was available – NATOPS. *Urgent Change Recommendations to any NATOPS publication can be made by priority message.*

In this case the NATOPS Flight Manual does not cover towing via the external hook. Therefore, the Urgent Change Recommendation would actually be an addition in the form of a *Warning*. If all the users are info addressees, then the ASO's task is accomplished through NATOPS. The point is, safety and NATOPS can and do work hand in glove.

MAJ H. A. Gideonse
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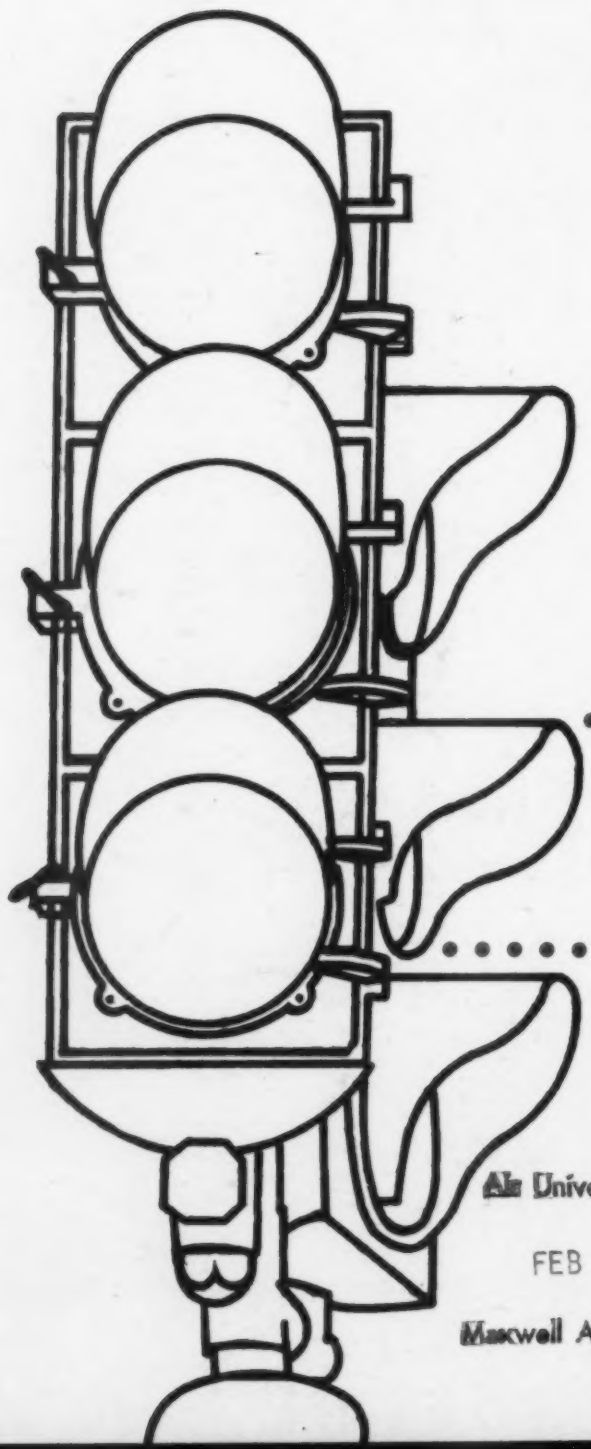

for the life of you don't JUMP it!